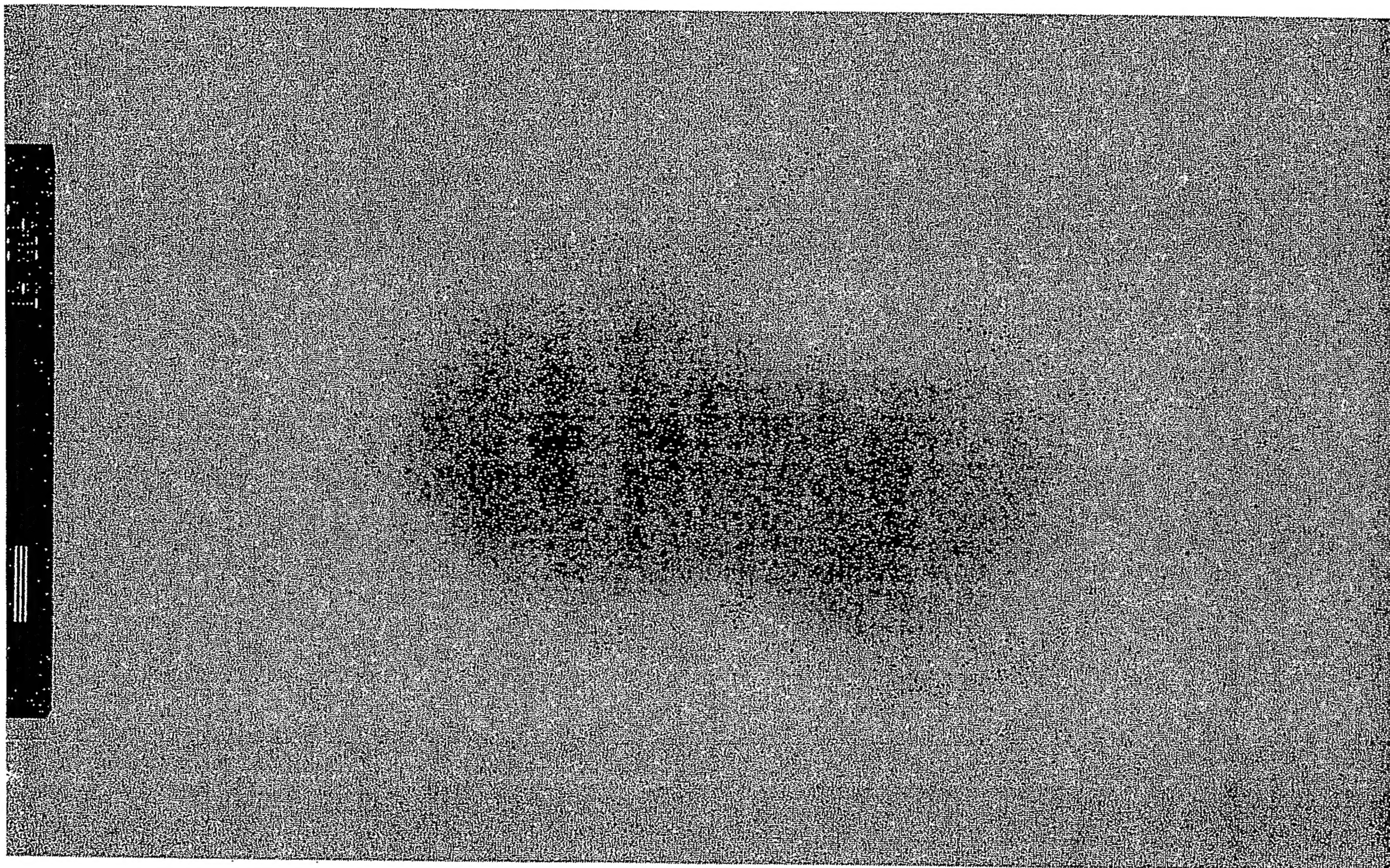


Figure 130





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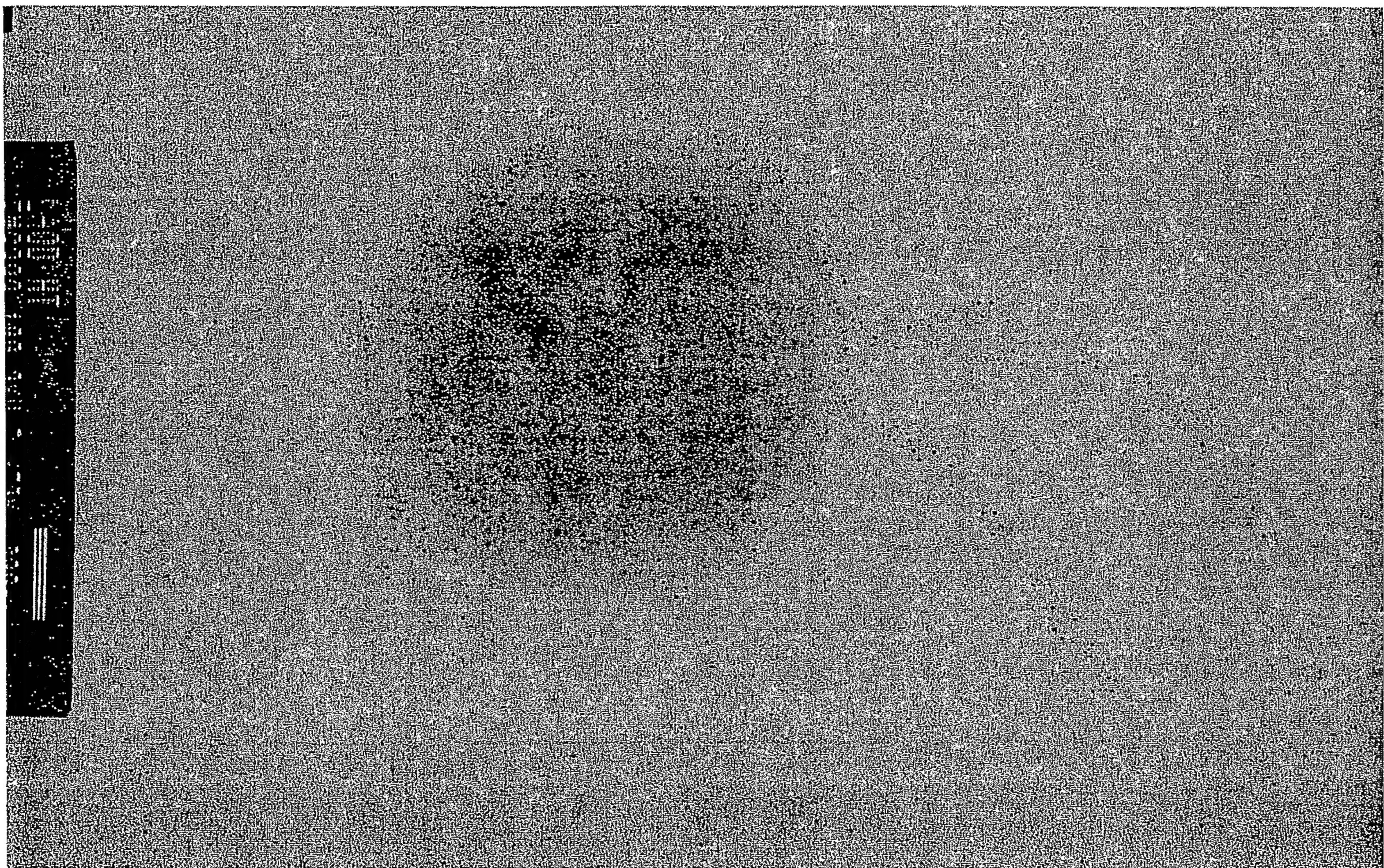
Figure 131





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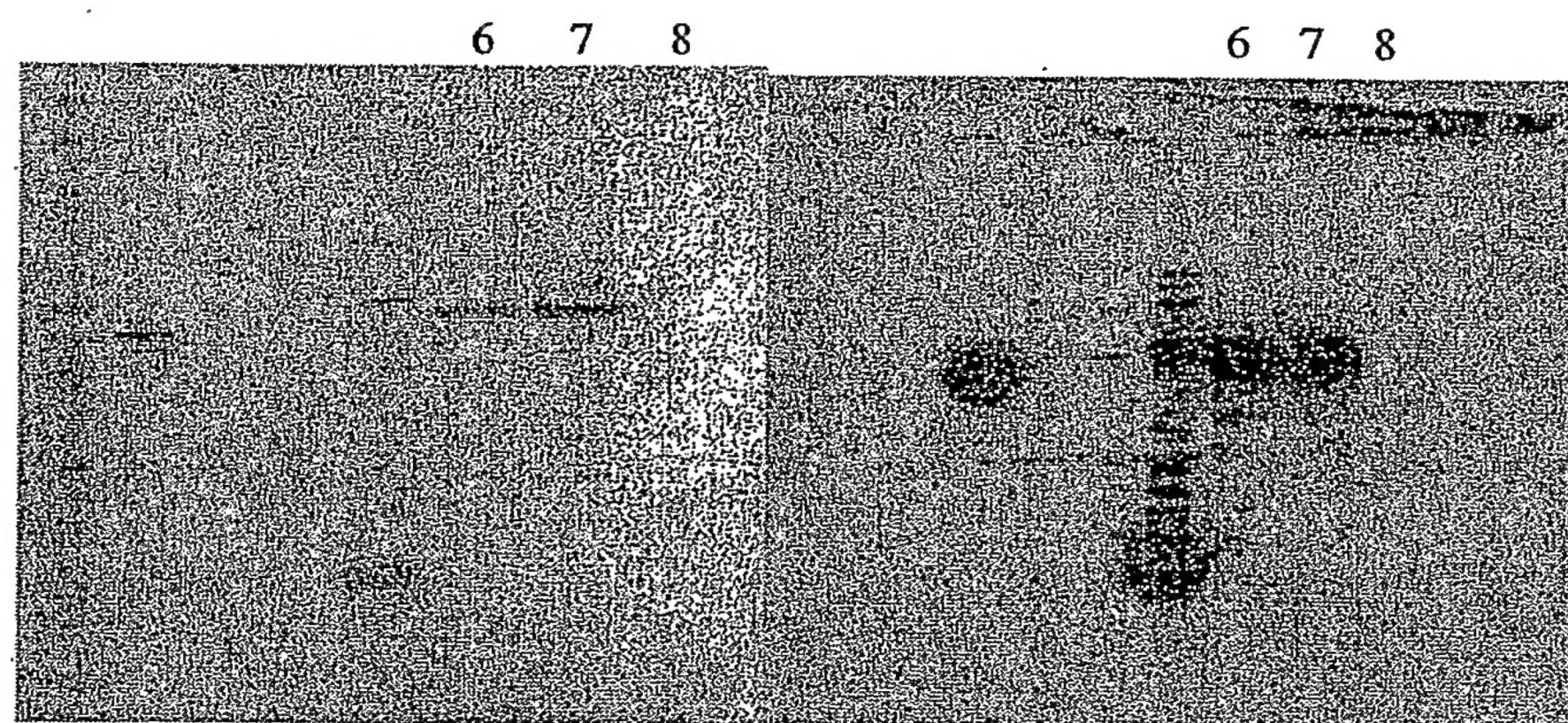
Figure 132





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Figure 133



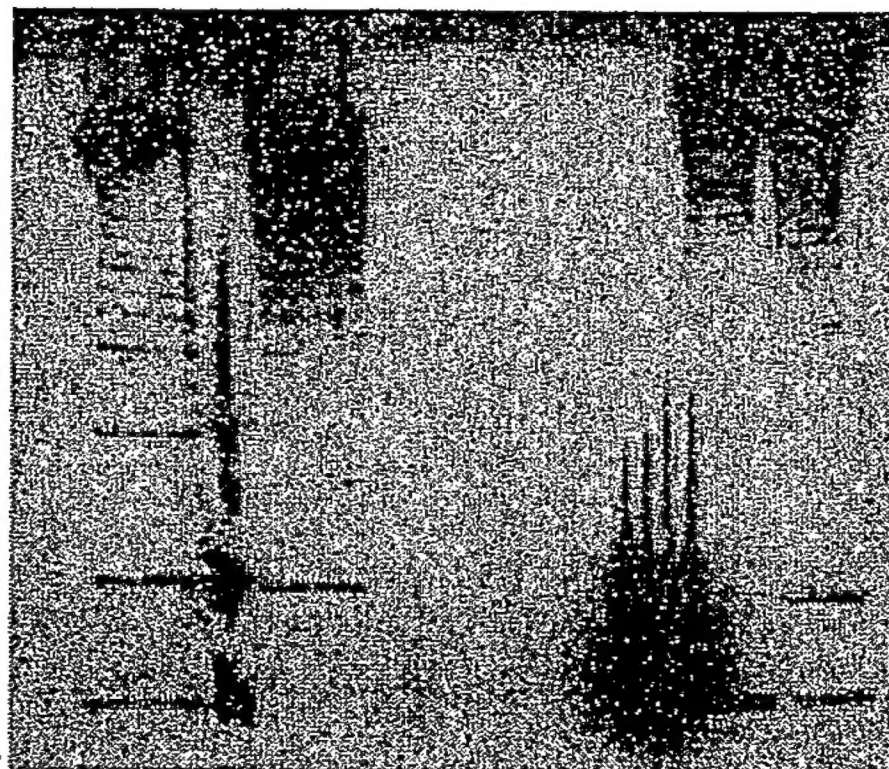
A

B



Figure 134

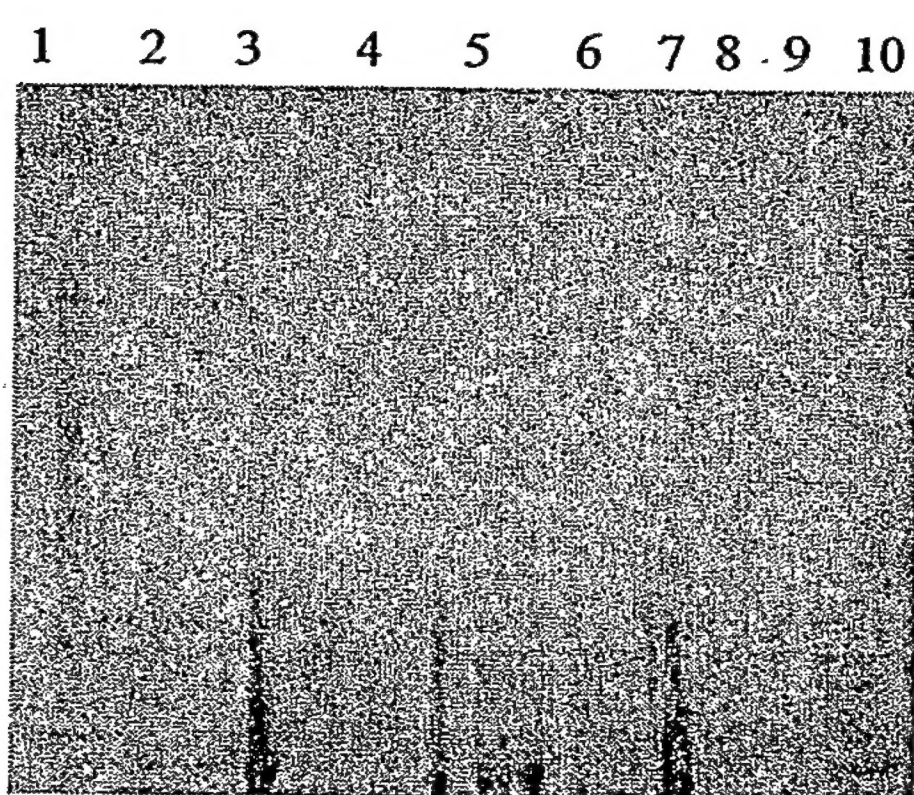
1 2 3 4 5 6 7 8 9 10





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**Figure 135**





# Pilus released by *Lactococcus* sonication

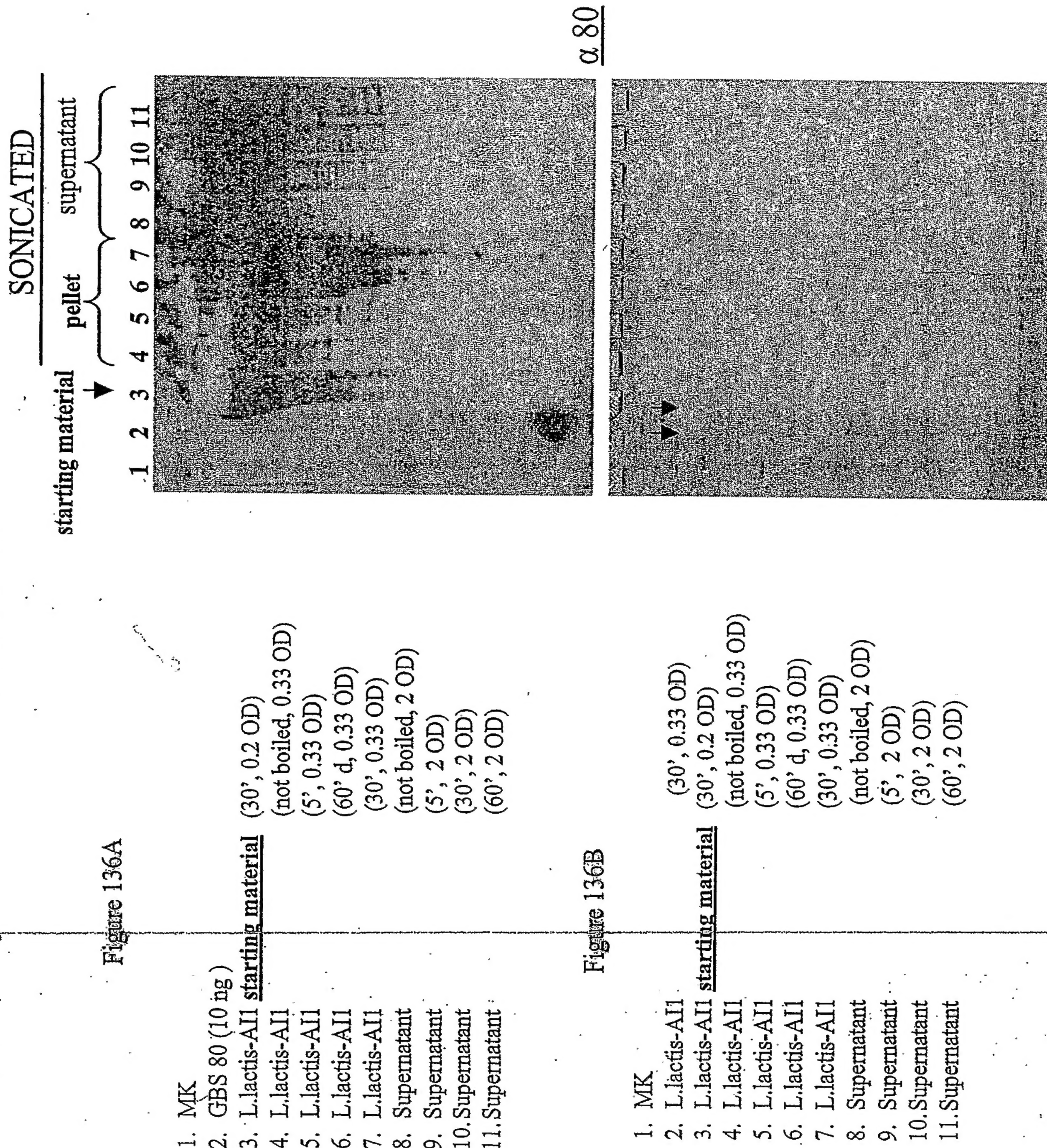


Figure 136A

1. MK
2. GBS 80 (10 ng)
3. L.lactis-AII starting material (30', 0.2 OD)
4. L.lactis-AII (not boiled, 0.33 OD)
5. L.lactis-AII (5', 0.33 OD)
6. L.lactis-AII (60' d, 0.33 OD)
7. L.lactis-AII (30', 0.33 OD)
8. Supernatant (not boiled, 2 OD)
9. Supernatant (5', 2 OD)
10. Supernatant (30', 2 OD)
11. Supernatant (60', 2 OD)

Figure 136B

1. MK
2. L.lactis-AII (30', 0.33 OD)
3. L.lactis-AII starting material (30', 0.2 OD)
4. L.lactis-AII (not boiled, 0.33 OD)
5. L.lactis-AII (5', 0.33 OD)
6. L.lactis-AII (60' d, 0.33 OD)
7. L.lactis-AII (30', 0.33 OD)
8. Supernatant (not boiled, 2 OD)
9. Supernatant (5', 2 OD)
10. Supernatant (30', 2 OD)
11. Supernatant (60', 2 OD)



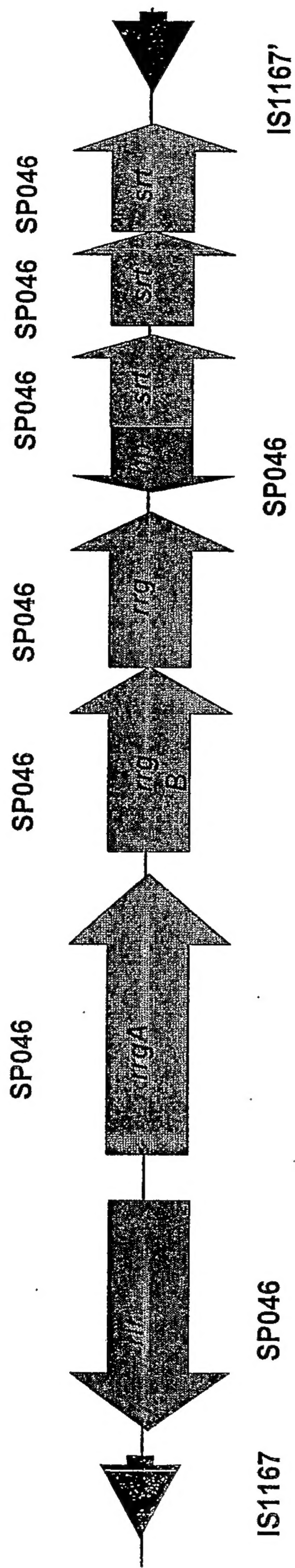


Figure 137



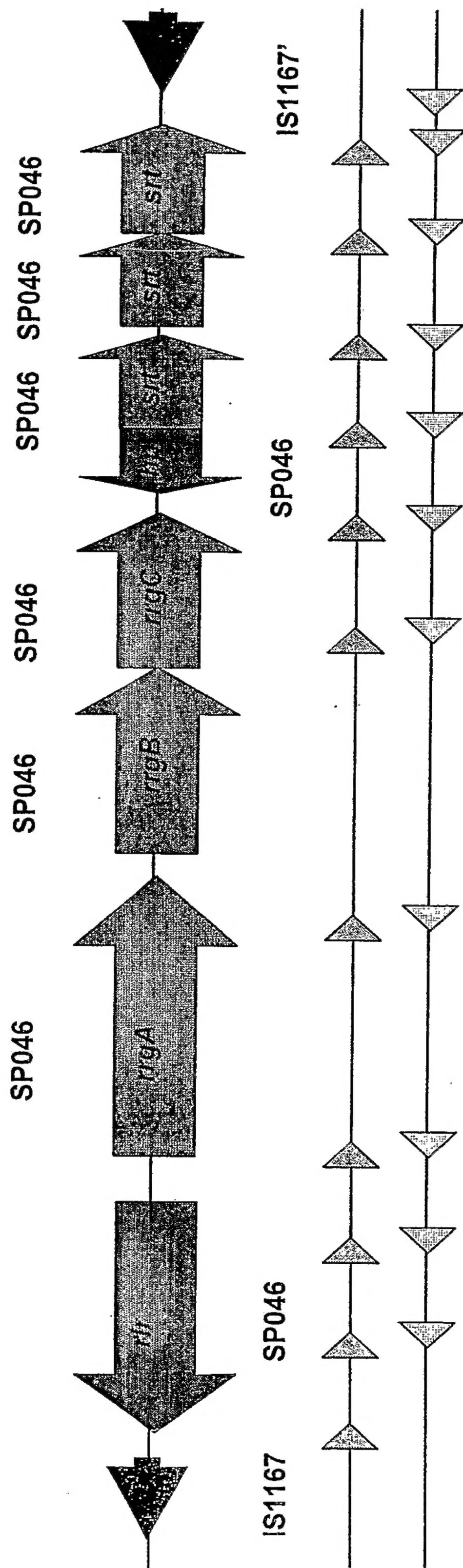
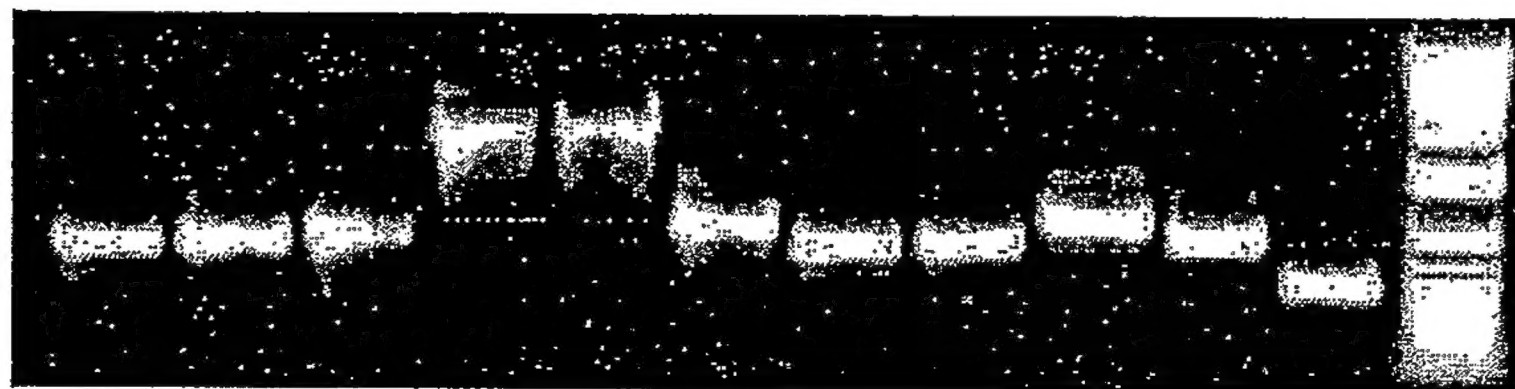


Figure 138



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A



TIGR4

B

PCR product	contig_length _TIGR4	overlap
1	754	83
2	759	84
3	847	98
4	2550	99
5	2736	99
6	925	99
7	745	87
8	765	94
9	1008	94
10	802	64
11	461	

Figure 139



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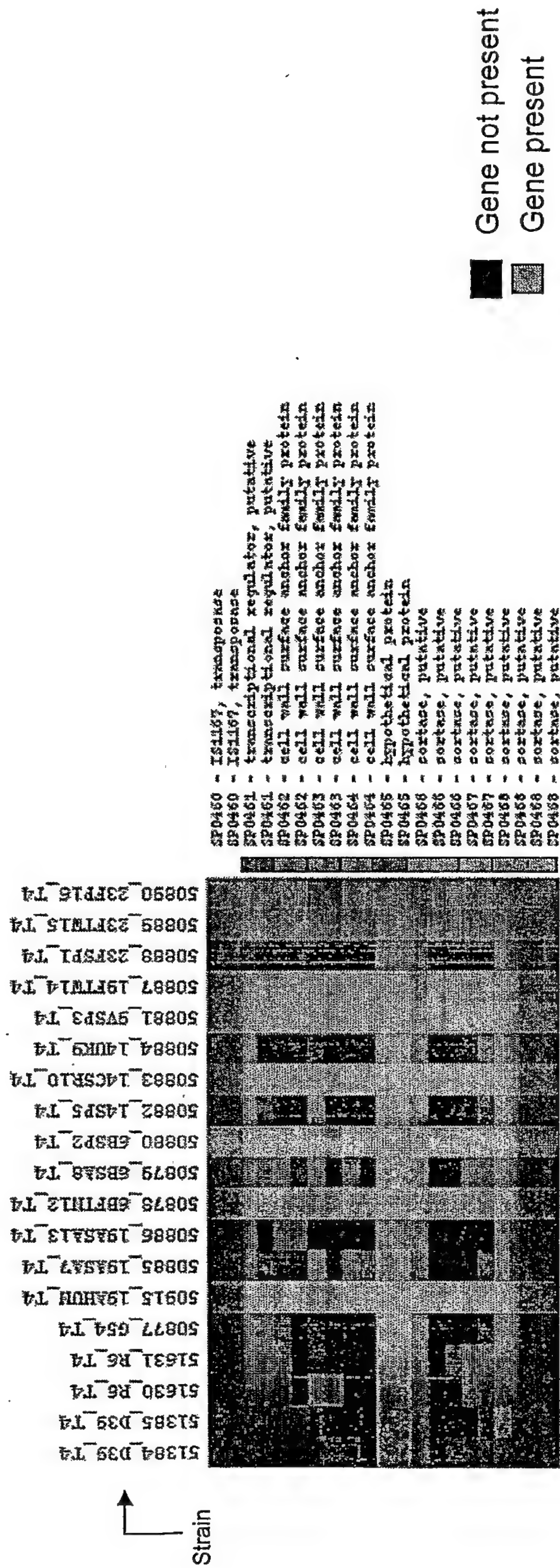


Figure 140



## Figure 141A

ORF2_14CSR	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_19AH	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_19FTW	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_23FP	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_23FTW	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_670	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_6BF	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_6BSP	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_TIGR	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
ORF2_9VSP	MLNKYIEKRITDKITILNILLDIRSIELDELSTLTSLQSKSLLSILQELQETFEELTFN
	*****
ORF2_14CSR	LDTQQVQLIEHHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_19AH	LDTQQVQLIEHHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_19FTW	LDTQQVQLIEHHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_23FP	LDTQQVQLIEHHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_23FTW	LDTQQVQLIEHHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_670	LDTQQVQLIEHHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_6BF	LDTQQVQLIEHHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_6BSP	LDTQQVQLIEHHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_TIGR	LDTQQVQLIEHHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
ORF2_9VSP	LDTQQVQLIEHHSHQTNYYFHQLYNQSTILKILRFFLLQGNQSFNEFTQKEYISIATGYR
	*****
ORF2_14CSR	VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMDWVTHMIVQ
ORF2_19AH	VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMDWVTHMIVQ
ORF2_19FTW	VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMDWVTHMIVQ
ORF2_23FP	VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMDWVTHMIVQ
ORF2_23FTW	VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMDWVTHMIVQ
ORF2_670	VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMDWVTHMIVQ
ORF2_6BF	VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMDWVTHMIVQ
ORF2_6BSP	VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMDWVTHMIVQ
ORF2_TIGR	VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMDWVTHMIVQ
ORF2_9VSP	VRQKCGLLLRSVGLDLVKNQVVGPEYRIRFLIALLOFHFGIEIYDLNDGSMDWVTHMIVQ
	*****
ORF2_14CSR	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_19AH	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_19FTW	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_23FP	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_23FTW	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_670	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_6BF	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_6BSP	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_TIGR	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
ORF2_9VSP	SNSQLSHELLEITPDEYVHFSILVALTWKRREFPLEFPESKEFEKLKNLFMYPILMEHCQ
	*****
ORF2_14CSR	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_19AH	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_19FTW	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_23FP	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_23FTW	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_670	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_6BF	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_6BSP	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_TIGR	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
ORF2_9VSP	TYLEPHANMTFTQEELDYIFLVYCSANSSFSKDKWNQEKKTHTIQLILQHTRGKHLLSKF
	*****



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## Figure 141B

ORF2\_14CSR KNILGNDISNSLSFLTALTFLTRTFLEGLQNLVPYYNYEYHYGIESDKPLYHISKAIVQE  
ORF2\_19AH KNILGNDISNSLSFLTALTFLTRTFLEGLQNLVPYYNYEYHYGIESDKPLYHISKAIVQE  
ORF2\_19FTW KNILGNDISNSLSFLTALTFLTRTFLEGLQNLVPYYNYEYHYGIESDKPLYHISKAIVQE  
ORF2\_23FP KNILGNDISNSLSFLTALTFLTRTFLEGLQNLVPYYNYEYHYGIESDKPLYHISKAIVQE  
ORF2\_23FTW KNILGNDISNSLSFLTALTFLTRTFLEGLQNLVPYYNYEYHYGIESDKPLYHISKAIVQE  
ORF2\_670 KNILGNDISNSLSFLTALTFLTRTFLEGLQNLVPYYNYEYHYGIESDKPLYHISKAIVQE  
ORF2\_6BF KNILGNDISNSLSFLTALTFLTRTFLEGLQNLVPYYNYEYHYGIESDKPLYHISKAIVQE  
ORF2\_6BSP KNILGNDISNSLSFLTALTFLTRTFLEGLQNLVPYYNYEYHYGIESDKPLYHISKAIVQE  
ORF2\_TIGR KNILGNDISNSLSFLTALTFLTRTFLEGLQNLVPYYNYEYHYGIESDKPLYHISKAIVQE  
ORF2\_9VSP KNILGNDISNSLSFLTALTFLTRTFLEGLQNLVPYYNYEYHYGIESDKPLYHISKAIVQE  
\*\*\*\*\*

ORF2\_14CSR WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAPIFIFIILNNQADVNLIKSIILRNFTDK  
ORF2\_19AH WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAPIFIFIILNNQADVNLIKSIILRNFTDK  
ORF2\_19FTW WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAPIFIFIILNNQADVNLIKSIILRNFTDK  
ORF2\_23FP WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAPIFIFIILNNQADVNLIKSIILRNFTDK  
ORF2\_23FTW WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAPIFIFIILNNQADVNLIKSIILRNFTDK  
ORF2\_670 WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAPIFIFIILNNQADVNLIKSIILRNFTDK  
ORF2\_6BF WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAPIFIFIILNNQADVNLIKSIILRNFTDK  
ORF2\_6BSP WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAPIFIFIILNNQADVNLIKSIILRNFTDK  
ORF2\_TIGR WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAPIFIFIILNNQADVNLIKSIILRNFTDK  
ORF2\_9VSP WMTEQKIEGVIDQHRLYLFSLYLTETIFSSLPAPIFIFIILNNQADVNLIKSIILRNFTDK  
\*\*\*\*\*

ORF2\_14CSR VASVTGYNILISPPPSEEHLEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR  
ORF2\_19AH VASVTGYNILISPPPSEEHLEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR  
ORF2\_19FTW VASVTGYNILISPPPSEEHLEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR  
ORF2\_23FP VASVTGYNILISPPPSEEHLEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR  
ORF2\_23FTW VASVTGYNILISPPPSEEHLEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR  
ORF2\_670 VASVTGYNILISPPPSEEHLEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR  
ORF2\_6BF VASVTGYNILISPPPSEEHLEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR  
ORF2\_6BSP VASVTGYNILISPPPSEEHLEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR  
ORF2\_TIGR VASVTGYNILISPPPSEEHLEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR  
ORF2\_9VSP VASVTGYNILISPPPSEEHLEPLIIITTKKEYLPYVKKQYPKGKHHFLTIALDLHVSQQR  
\*\*\*\*\*

ORF2\_14CSR LIYQTIVDIRKEAFDKRVAMIAKKAHYLL  
ORF2\_19AH LIYQTIVDIRKEAFDKRVAMIAKKAHYLL  
ORF2\_19FTW LIYQTIVDIRKEAFDKRVAMIAKKAHYLL  
ORF2\_23FP LIYQTIVDIRKEAFDKRVAMIAKKAHYLL  
ORF2\_23FTW LIYQTIVDIRKEAFDKRVAMIAKKAHYLL  
ORF2\_670 LIYQTIVDIRKEAFDKRVAMIAKKAHYLL  
ORF2\_6BF LIYQTIVDIRKEAFDKRVAMIAKKAHYLL  
ORF2\_6BSP LIYQTIVDIRKEAFDKRVAMIAKKAHYLL  
ORF2\_TIGR LIYQTIVDIRKEAFDKRVAMIAKKAHYLL  
ORF2\_9VSP LIYQTIVDIRKEAFDKRVAMIAKKAHYLL  
\*\*\*\*\*



## Figure 142A

ORF3\_19AH  
ORF3\_23FP  
ORF3\_14CSR  
ORF3\_670  
ORF3\_6BF  
ORF3\_6BSP  
ORF3\_19FTW  
ORF3\_9VSP  
ORF3\_23FTW  
ORF3\_TIGR

[illegible]

ORF3\_19AH  
ORF3\_23FP  
ORF3\_14CSR  
ORF3\_670  
ORF3\_6BF  
ORF3\_6BSP  
ORF3\_19FTW  
ORF3\_9VSP  
ORF3\_23FTW  
ORF3\_TIGR

```

ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPPVGYKPSTKQWTVEVEKNGRT
ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPPVGYKPSTKQWTVEVEKNGRT
ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPPVGYKPSTKQWTVEVEKNGRT
ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPPVGYKPSTKQWTVEVEKNGRT
ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPPVGYKPSTKQWTVEVEKNGRT
ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPPVGYKPSTKQWTVEVEKNGRT
ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPPVGYKPSTKQWTVEVEKNGRT
ELKNNTNGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPPVGYKPSTKQRTVEVEKNGRT
ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPPVGYKPSTKQWTVEVEKNGRT
ELKNNTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPPVGYKPSTKQWTVEVEKNGRT
***** : *****

```

ORF3\_19AH  
ORF3\_23FP  
ORF3\_14CSR  
ORF3\_670  
ORF3\_6BF  
ORF3\_6BSP  
ORF3\_19FTW  
ORF3\_9VSP  
ORF3\_23FTW  
ORF3\_TIGR

[illegible]

ORF3\_19AH  
ORF3\_23FP  
ORF3\_14CSR  
ORF3\_670  
ORF3\_6BF  
ORF3\_6BSP  
ORF3\_19FTW  
ORF3\_9VSP  
ORF3\_23FTW  
ORF3\_TIGR

```

TLSKRIYQVNNLDDNQYGIELTVSGKTTVETKEASTPLDVVILLDNSNSMSNIRHNHAHR
TLSKRIYQVNNLDDNQYGIELTVSGKTTVETKEASTPLDVVILLDNSNSMSNIRHNHAHR
TLSKRIYQVNNLDDNQYGIELTVSGKTTVETKEASTPLDVVILLDNSNSMSNIRHNHAHR
TLSKRIYQVNNLDDNQYGIELTVSGKTTVETKEASTPLDVVILLDNSNSMSNIRHNHAHR
TLSKRIYQVNNLDDNQYGIELTVSGKTTVETKEASTPLDVVILLDNSNSMSNIRHNHAHR
TLSKRIYQVNNLDDNQYGIELTVSGKTTVETKEASTPLDVVILLDNSNSMSNIRHNHAHR
TLSKRIYQVNNLDDNQYGIELTVSGKTVYERKDKSVPLDVVILLDNSNSMSNIRNKNARR
TLSKRIYQVNNLDDNQYGIELTVSGKTVYERKDKSVPLDVVILLDNSNSMSNIRNKNARR
TLSKRIYQVNNLDDNQYGIELTVSGKTVYEQKDKSVPLDVVILLDNSNSMSNIRNKNARR
TLSKRIYQVNNLDDNQYGIELTVSGKTVYEQKDKSVPLDVVILLDNSNSMSNIRNKNARR
*****. * *: *.*****. . . .

```

ORF3\_19AH  
ORF3\_23FP  
ORF3\_14CSR  
ORF3\_670  
ORF3\_6BF  
ORF3\_6BSP  
ORF3\_19FTW  
ORF3\_9VSP  
ORF3\_23FTW  
ORF3\_TIGR

```
AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKGVADANGKILNDSALWTF
AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKGVADANGKILNDSALWTF
AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKGVADANGKILNDSALWTF
AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKGVADANGKILNDSALWTF
AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKGVADANGKILNDSALWTF
AEKAGEATRALVDKITSNPDNRVALVTYGSTIFDGSEATVEKGVADANGKILNDSALWTF
AERAGEATRSLIDKITSDPENRVALVTYASTIFDGTEFTVEKGVADKNGKRLNDSLFWNY
AERAGEATRSLIDKITSDPENRVALVTYASTIFDGTEFTVEKGVADKNGKRLNDSLFWNY
AERAGEATRSLIDKITSDPENRVALVTYASTIFDGTEFTVEKGVADKNGKRLNDSLFWNY
AERAGEATRSLIDKITSSENPRVALVTYASTIFDGTEFTVEKGVADKNGKRLNDSLFWNY
*:*****.:*****.:*****.*****.*****.* ***** **
```



Figure 142B

ORF3\_19AH  
ORF3\_23FP  
ORF3\_14CSR  
ORF3\_670  
ORF3\_6BF  
ORF3\_6BSP  
ORF3\_19FTW  
ORF3\_9VSP  
ORF3\_23FTW  
ORF3\_TIGR

DRTTFTAКТYNYSFLNLTSDPTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD  
DRTTFTAКТYNYSFLNLTSDPTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD  
DRTTFTAКТYNYSFLNLTSDPTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD  
DRTTFTAКТYNYSFLNLTSDPTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD  
DRTTFTAКТYNYSFLNLTSDPTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD  
DRTTFTAКТYNYSFLNLTSDPTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD  
DRTTFTAКТYNYSFLNLTSDPTDIQTIKDRIPSDAEELNKDKLMYQFGATFTQKALMTAD  
DQTSFТTNTKDYSYLKLТNDKNДIVELKNKVPTЕAEDHDGNRLMYQFGATFTQKALMKAD  
DQTSFТTNTKDYSYLKLТNDKNДIVELKNKVPTЕAEDHDGNRLMYQFGATFTQKALMKAD  
DQTSFТTNTKDYSYLKLТNDKNДIVELKNKVPTЕAEDHDGNRLMYQFGATFTQKALMKAD  
DQTSFТTNTKDYSYLKLТNDKNДIVELKNKVPTЕAEDHDGNRLMYQFGATFTQKALMKAD  
\*: \*: \*\*: \* : \*: \*: \*. \* . \*\* : \*: \*: \*: \*: \*: : : : \*\*\*\*\* \*

ORF3\_19AH  
ORF3\_23EP  
ORF3\_14CSR  
ORF3\_670  
ORF3\_6BF  
ORF3\_6BSP  
ORF3\_19FTW  
ORF3\_9VSP  
ORF3\_23FTW  
ORF3\_TIGR

DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNEFKAKTPNSSGILLE  
DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNEFKAKTPNSSGILLE  
DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNEFKAKTPNSSGILLE  
DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNEFKAKTPNSSGILLE  
DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNEFKAKTPNSSGILLE  
DILTKQARPNSKKVIFHITDGVPTMSYPINFKYTGTTQSYRTQLNNEFKAKTPNSSGILLE  
EILTQQARQNSQKVIFHITDGVPTMSYPINFENHATFAPSYQNQLNAFFFSKSPNKDGILLS  
EILTQQARQNSQKVIFHITDGVPTMSYPINFENHATFAPSYQNQLNVFFFSKSPNKDGILLS  
EILTQQARQNSQKVIFHITDGVPTMSYPINFENHATFAPSYQNQLNAFFFSKSPNKDGILLS  
EILTQQARQNSQKVIFHITDGVPTMSYPINFENHATFAPSYQNQLNAFFFSKSPNKDGILLS  
:\*\*\*:\*\*\* \*\*:\*\*\*\*\*::: : \*\*: .\*\*\* \* :\*:\*\* .\*\*\*\*

ORF3\_19AH  
ORF3\_23FP  
ORF3\_14CSR  
ORF3\_670  
ORF3\_6BF  
ORF3\_6BSP  
ORF3\_19FTW  
ORF3\_9VSP  
ORF3\_23FTW  
ORF3\_TIGR

DFVTWSADGEHKIVRGDGESYQMF~~TK~~KPVTDQYGVHQILSITSMEQRAKLVSAGYRFGT  
DFVTWSADGEHKIVRGDGESYQMF~~TK~~KPVTDQYGVHQILSITSMEQRAKLVSAGYRFGT  
DFVTWSADGEHKIVRGDGESYQMF~~TK~~KPVTDQYGVHQILSITSMEQRAKLVSAGYRFGT  
DFVTWSADGEHKIVRGDGESYQMF~~TK~~KPVTDQYGVHQILSITSMEQRAKLVSAGYRFGT  
DFVTWSADGEHKIVRGDGESYQMF~~TK~~KPVTDQYGVHQILSITSMEQRAKLVSAGYRFGT  
DFVTWSADGEHKIVRGDGESYQMF~~TK~~KPVTDQYGVHQILSITSMEQRAKLVSAGYRFGT  
DFITQATSGEHTIVRGDGQSYQMFTDKTVYEK-GAPAAFPVK-PEKYSEMKAAGYAVIGD  
DFITQATSGEHTIVRGDGQSYQMFTDKTVYEK-GAPAAFPVK-PEKYSEMKAAGYAVIGD  
DFITQATSGEHTIVRGDGQSYQMFTDKTVYEK-GAPAAFPVK-PEKYSEMKAAGYAVIGD  
DFITQATSGEHTIVRGDGQSYQMFTDKTVYEK-GAPAAFPVK-PEKYSEMKAAGYAVIGD  
\*: \* :. :. \*. \*. \*. \*. \*. \*. \*. \*. \*. :. :. \*. :. :. :. :. :. :. \*

ORF3\_19AH  
ORF3\_23FP  
ORF3\_14CSR  
ORF3\_670  
ORF3\_6BF  
ORF3\_6BSP  
ORF3\_19FTW  
ORF3\_9VSP  
ORF3\_23FTW  
ORF3\_TIGR

```

-----DLYLYWRDSILAYPFNSSTDWITNHGDPPTWYYNGNMAQDGYDVFTVGVGVNGDP
-----DLYLYWRDSILAYPFNSSTDWITNHGDPPTWYYNGNMAQDGYDVFTVGVGVNGDP
-----DLYLYWRDSILAYPFNSSTDWITNHGDPPTWYYNGNMAQDGYDVFTVGVGVNGDP
-----DLYLYWRDSILAYPFNSSTDWITNHGDPPTWYYNGNMAQDGYDVFTVGVGVNGDP
-----DLYLYWRDSILAYPFNSSTDWITNHGDPPTWYYNGNMAQDGYDVFTVGVGVNGDP
-----DLYLYWRDSILAYPFNSSTDWITNHGDPPTWYYNGNMAQDGYDVFTVGVGVNGDP
PINGGYIWLNWRESILAYPFNSNTAKITNHGAPTRWYYNGNIAPDGYDVFTVGIGINGDP
PINGGYIWLNWRESILAYPFNSNTAKITNHGDPTRWYYNGNIAPDGYDVFTVGIGINGDP
PINGGYIWLNWRESILAYPFNSNTAKITNHGDPTRWYYNGNIAPDGYDVFTVGIGINGDP
PINGGYIWLNWRESILAYPFNSNTAKITNHGDPTRWYYNGNIAPDGYDVFTVGIGINGDP
: * *:*****.* ***** ** *****: * *****.*.*****

```

ORF3\_19AH  
ORF3\_23FP  
ORF3\_14CSR  
ORF3\_670  
ORF3\_6BF  
ORF3\_6BSP  
ORF3\_19FTW  
ORF3\_9VSP  
ORF3\_23FTW  
ORF3\_TIGR

```

GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENTGTITDPMGEL
GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENTGTITDPMGEL
GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENTGTITDPMGEL
GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENTGTITDPMGEL
GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENTGTITDPMGEL
GTDEATATRFMQSISSSPDNYTNVADPSQILQELNRYFYTIVNEKKSIENTGTITDPMGEL
GTDEATATSEFMQSISSKPENYTNVTDTTKILEQLNRYFHTIVTEKKSIENTGTITDPMGEL
GTDEATATSEFMQSISSKPENYTNVTDTTKILEQLNRYFHTIVTEKKSIENTGTITDPMGEL
GTDEATATSEFMQSISSKPENYTNVTDTTKILEQLNRYFHTIVTEKKSIENTGTITDPMGEL
GTDEATATSEFMQSISSKPENYTNVTDTTKILEQLNRYFHTIVTEKKSIENTGTITDPMGEL
*****  ***** . *:*****:*.::**::*****:***.*****

```



## Figure 142C

ORF3\_19AH  
ORF3\_23FP  
ORF3\_14CSR  
ORF3\_670  
ORF3\_6BF  
ORF3\_6BSP  
ORF3\_19FTW  
ORF3\_9VSP  
ORF3\_23FTW  
ORF3\_TIGR

IDFQLGADGRFDPADYTLTANDGSSSLVNNVPTGGPQNDGGLLKNAKVFYDTTEKRIRVTG  
IDFQLGADGRFDPADYTLTANDGSSSLVNNVPTGGPQNDGGLLKNAKVFYDTTEKRIRVTG  
IDFQLGADGRFDPADYTLTANDGSSSLVNNVPTGGPQNDGGLLKNAKVFYDTTEKRIRVTG  
IDFQLGADGRFDPADYTLTANDGSSSLVNNVPTGGPQNDGGLLKNAKVFYDTTEKRIRVTG  
IDFQLGADGRFDPADYTLTANDGSSSLVNNVPTGGPQNDGGLLKNAKVFYDTTEKRIRVTG  
IDFQLGADGRFDPADYTLTANDGSSSLVNNVPTGGPQNDGGLLKNAKVFYDTTEKRIRVTG  
IDLQLGTDGRFDPADYTLTANDGSRLENGQAVGGPQNDGGLLKNAKVFYDTTEKRIRVTG  
IDLQLGTDGRFDPADYTLTANDGSRLENGQAVGGPQNDGGLLKNAKVFYDTTEKRIRVTG  
IDLQLGTDGRFDPADYTLTANDGSRLENGQAVGGPQNDGGLLKNAKVLYDTTEKRIRVTG  
IDLQLGTDGRFDPADYTLTANDGSRLENGQAVGGPQNDGGLLKNAKVLYDTTEKRIRVTG  
\*: \*: \*\*\*\*\* \* \* . \*\*\*\*\* \*

ORF3\_19AH  
ORF3\_23FP  
ORF3\_14CSR  
ORF3\_670  
ORF3\_6BF  
ORF3\_6BSP  
ORF3\_19FTW  
ORF3\_9VSP  
ORF3\_23FTW  
ORF3\_TIGR

[illegible]

ORF3\_19AH  
ORF3\_23FP  
ORF3\_14CSR  
ORF3\_670  
ORF3\_6BF  
ORF3\_6BSP  
ORF3\_19FTW  
ORF3\_9VSP  
ORF3\_23FTW  
ORF3\_TIGR

```
EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLOKQHPDYPDIYGAIDQNGTYQNVRTGE
EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLOKQHPDYPDIYGAIDQNGTYQNVRTGE
EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLOKQHPDYPDIYGAIDQNGTYQNVRTGE
EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLOKQHPDYPDIYGAIDQNGTYQNVRTGE
EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLOKQHPDYPDIYGAIDQNGTYQNVRTGE
EITIPKEKKLGEIEFIKINKNDKKPLRDAVFSLOKQHPDYPDIYGAIDQNGTYQNVRTGE
AITIAKEKKLGEIEFIKINKNDKKPLRDAVFSLOKQHPDYPDIYGAIDQNGTYQNVRTGE
AITIAKEKKLGEIEFIKINKNDKKPLRDAVFSLOKQHPDYPDIYGAIDQNGTYQNVRTGE
EITISKEKKLGDIEFIKVNKNDKKPLRDAVFSLOKQHPDYPDIYGAIDQNGTYQNVRTGE
EITISKEKKLGDIEFIKVNKNDKKPLRGAVFSLOKQHPDYPDIYGAIDQNGTYQNVRTGE
***  ***** . ***** . ***** . ***** . ***** . *****
```

ORF3\_19AH  
ORF3\_23FP  
ORF3\_14CSR  
ORF3\_670  
ORF3\_6BF  
ORF3\_6BSP  
ORF3\_19FTW  
ORF3\_9VSP  
ORF3\_23FTW  
ORF3\_TIGR

[illegible]

ORF3\_19AH  
ORF3\_23FP  
ORF3\_14CSR  
ORF3\_670  
ORF3\_6BF  
ORF3\_6BSP  
ORF3\_19FTW  
ORF3\_9VSP  
ORF3\_23FTW  
ORF3\_TIGR

TNDKHYITNEPIPPKREYPRTGIGIMLPFYILIGCMMMGGVLLYTRKNP  
TNDKHYITNEPIPPKREYPRTGIGIMLPFYILIGCMMMGGVLLYTRKNP  
TNDKHYITNEPIPPKREYPRTGIGIMLPFYILIGCMMMGGVLLYTRKHP  
TNDKHYITNEPIPPKREYPRTGIGIMLPFYILIGCMMMGGVLLYTRKHP  
TNDKHYITNEPIPPKREYPRTGIGIMLPFYILIGCMMMGGVLLYTRKHP  
TNDKHYITNEPIPPKREYPRTGIGIMLPFYILIGCMMMGGVLLYTRKHP  
TNDKHYITNEPIPPKREYPRTGIGIMLPFYILIGCMMMGGVLLYTRKHP  
TNDKHYITNEPIPPKREYPRTGIGIMLLFYILIGCMMMGGVLLYTRKHP  
TNDKHYITNEPIPPKREYPRTGIGIMLPFYILIGCMMMGGVLLYTRKHP  
TNDKHYITNEPIPPKREYPRTGIGIMLPFYILIGCMMMGGVLLYTRKHP  
\*\*\*\*\*



Figure 143A

ORF4\_6BF  
ORF4\_6BSP  
ORF4\_670  
ORF4\_14CSR  
ORF4\_19AH  
ORF4\_23FP  
ORF4\_23FTW  
ORF4\_19FTW  
ORF4\_9VSP  
ORF4\_TIGR

```

MKSINKFLTMLAALLLTASSLSAATVFAADNVSTAPDAVTKTTLTIHKLLLSSEDDLKTWD
MKSINKFLTMLAALLLTASSLSAATVFAADNVSTAPDAVTKTTLTIHKLLLSSEDDLKTWD
MKSINKFLTMLAALLLTASSLSAATVFAADNVSTAPDAVTKTTLTIHKLLLSSEDDLKTWD
MKSINKFLTMLAALLLTASSLSAATVFAADNVSTAPDAVTKTTLTIHKLLLSSEDDLKTWD
MKSINKFLTMLAALLLTASSLSAATVFAADNVSTAPDAVTKTTLTIHKLLLSSEDDLKTWD
MKSINKFLTMLAALLLTASSLSAATVFAADNVSTAPDAVTKTTLTIHKLLLSSEDDLKTWD
MKSINKFLTMLAALLLTASSLSAATVFAAEQK-----TKTLTVHKLLMTDQELDawn
MKSINKFLTMLAALLLTASSLSAATVFAAGTT-----TTSVTVHKLLATDGDMDKIA
MKSINKFLTMLAALLLTASSLSAATVFAAGTT-----TTSVTVHKLLATDGDMDKIA
MKSINKFLTMLAALLLTASSLSAATVFAAGTT-----TTSVTVHKLLATDGDMDKIA
*****.:*****.*****
*.:*:***:::

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ORF4\_6BF  
ORF4\_6BSP  
ORF4\_670  
ORF4\_14CSR  
ORF4\_19AH  
ORF4\_23FP  
ORF4\_23FTW  
ORF4\_19FTW  
ORF4\_9VSP  
ORF4\_TIGR

```
TNGPK--GYDGTQ-----SSLKDLTGVA--EEIPNVYFELQKYNLTDGKEKENLKDD-S
TNGPK--GYDGTQ-----SSLKDLTGVA--EEIPNVYFELQKYNLTDGKEKENLKDD-S
TNGPK--GYDGTQ-----SSLKDLTGVA--EEIPNVYFELQKYNLTDGKEKENLKDD-S
TNGPK--GYDGTQ-----SSLKDLTGVA--EEIPNVYFELQKYNLTDGKEKENLKDD-S
TNGPK--GYDGTQ-----SSLKDLTGVA--EEIPNVYFELQKYNLTDGKEKENLKDD-S
TNGPK--GYDGTQ-----SSLKDLTGVA--EEIPNVYFELQKYNLTDGKEKENLKDD-S
SDAITTAGYDGSQN---FEQFKQLQGVPGVTEISGVAFELQSYTGPQGKEQENLTND-A
NELETG-NYAGNKVGVLPAKAKEIAGVMFVWNTNTNNEIIDENGQTLGVNIDPQTFKLGA
NELETG-NYAGNKVGVLPAKAKEIAGVMFVWNTNTNNEIIDENGQTLGVNIDPQTFKLGA
NELETG-NYAGNKVGVLPAKAKEIAGVMFVWNTNTNNEIIDENGQTLGVNIDPQTFKLGA
.: . . * *: . *: * : . . : : . . : : . . :
```

ORF4\_6BF  
ORF4\_6BSP  
ORF4\_670  
ORF4\_14CSR  
ORF4\_19AH  
ORF4\_23FP  
ORF4\_23FTW  
ORF4\_19FTW  
ORF4\_9VSP  
ORF4\_TIGR

KWTTVHGGGLTTKDGLKIETSTLKG-VYRIREDRTKTTYVGPNGQVLTGSKAVPALVTLPL  
KWTTVHGGGLTTKDGLKIETSTLKG-VYRIREDRTKTTYVGPNGQVLTGSKAVPALVTLPL  
KWTTVHGGGLTTKDGLKIETSTLKG-VYRIREDRTKTTYVGPNGQVLTGSKAVPALVTLPL  
KWTTVHGGGLTTKDGLKIETSTLKG-VYRIREDRTKTTYVGPNGQVLTGSKAVPALVTLPL  
KWTTVHGGGLTTKDGLKIETSTLKG-VYRIREDRTKTTYVGPNGQVLTGSKAVPALVTLPL  
KWTTVHGGGLTTKDGLKIETSTLKG-VYRIREDRTKTTYVGPNGQVLTGSKAVPALVTLPL  
VWTAVNKGVTETETGVKFDTEVLQG-TYRLVEVRKESTYVGPNGKVLTGMKAVPALITLPL  
MPATAMKKLTEAEGAKFNTANLPAKYKIYEIHSLSYVGEDGATLTGSKAVPIEIELPL  
MPATAMKKLTEAEGAKFNTANLPAKYKIYEIHSLSYVGEDGATLTGSKAVPIEIELPL  
MPATAMKKLTEAEGAKFNTANLPAKYKIYEIHSLSYVGEDGATLTGSKAVPIEIELPL  
:: : \* \* \* : : \* \* . \* : : \* : . : \* \* \* : \* . \* \* \* \* \* : \* \* \*

ORF4\_6BF  
ORF4\_6BSP  
ORF4\_670  
ORF4\_14CSR  
ORF4\_19AH  
ORF4\_23FP  
ORF4\_23FTW  
ORF4\_19FTW  
ORF4\_9VSP  
ORF4\_TIGR

VNNNGTVIDAHVFPKNSYNKPVVDKRIADTLNYND-----QNGLSIGTKIPYVVNNTTI  
VNNNGTVIDAHVFPKNSYNKPVVDKRIADTLNYND-----QNGLSIGTKIPYVVNNTTI  
VNNNGTVIDAHVFPKNSYNKPVVDKRIADTLNYND-----QNGLSIGTKIPYVVNNTTI  
VNNNGTVIDAHVFPKNSYNKPVVDKRIADTLNYND-----QNGLSIGTKIPYVVNNTTI  
VNNNGTVIDAHVFPKNSYNKPVVDKRIADTLNYND-----QNGLSIGTKIPYVVNNTTI  
VNNNGTVIDAHVFPKNSYNKPVVDKRIADTLNYND-----QNGLSIGTKIPYVVNNTTI  
VNQNGVVENAHVYPKNSSEDKPTATKTFDTAAGFVDP-----GEKGLAIGTKVPYIVTTTTI  
ND-----VVDHVYPKNTAKPKIDKDFKGKANPDTPRVVDKDTFVNHQVGDVVEYEIVTKI  
ND-----VVDHVYPKNTAKPKIDKDFKGKANPDTPRVVDKDTFVNHQVGDVVEYEIVTKI  
ND-----VVDHVYPKNTAKPKIDKDFKGKANPDTPRVVDKDTFVNHQVGDVVEYEIVTKI  
:  
\* :\*\*\*:\*\*\*: \*\* \* : . \* . \* . \*

ORF4\_6BF  
ORF4\_6BSP  
ORF4\_670  
ORF4\_14CSR  
ORF4\_19AH  
ORF4\_23FP  
ORF4\_23FTW  
ORF4\_19FTW  
ORF4\_9VSP  
ORF4\_TIGR

PSNATFATSFWSDEMTEGLTYN-EDVTITLNNVAMDQADYEVTKGNNGFNLKLTEAGLAK  
PSNATFATSFWSDEMTEGLTYN-EDVTITLNNVAMDQADYEVTKGNNGFNLKLTEAGLAK  
PSNATFATSFWSDEMTEGLTYN-EDVTITLNNVAMDQADYEVTKGNNGFNLKLTEAGLAK  
PSNATFATSFWSDEMTEGLTYN-EDVTITLNNVAMDQADYEVTKGNNGFNLKLTEAGLAK  
PSNATFATSFWSDEMTEGLTYN-EDVTITLNNVAMDQADYEVTKGXNGFNLKLTEAGLAK  
PSNATFATSFWSDEMTEGLTYN-EDVTITLNNVAMDQADYEVTKGINGFNLKLTEAGLAK  
PKNSTLATAFWSDEMTEGLDYN-GDVVVNYNGQPLDNSHYTLEAGHNGFILKLNEKGLEA  
PALANYATANWSDRMTEGLAFNKGTVKVTVDVALEAGDYALTEVATGFDLKLTDAGLAK  
PALANYATANWSDRMTEGLAFNKGTVKVTVDVALEAGDYALTEVATGFDLKLTDAGLAK  
PALANYATANWSDRMTEGLAFNKGTVKVTVDVALEAGDYALTEVATGFDLKLTDAGLAK  
\* : \*\* : \*\*\*.\*\*\*\*\* : \* \* : : : : \* : \*\* \*\*\* - \*\*



Figure 143B

[illegible]



PCT/US05/27239

## Figure 143C

ORF4_6BF	AKIDD-VEFVVGAGSWNQG--EFNYLKDVQKNDATKVVNKKITLPOTGGIGTIIFAV
ORF4_6BSP	AKIDD-VEFVVGAGSWNQG--EFNYLKDVQKNDATKVVNKKITLPOTGGIGTIIFAV
ORF4_670	AKIDD-VEFVVGAGSWNQG--EFNYLKDVQKNDATKVVNKKITLPOTGGIGTIIFAV
ORF4_14CSR	AKIDD-VEFVVGAGSWNQG--EFNYLKDVQKNDATKVVNKKITLPOTGGIGTIIFAV
ORF4_19AH	AKIDD-VEFVVGAGSWNQG--EFNYLKDVQKNDATKVVNKKITLPOTGGIGTIIFAV
ORF4_23FP	AKIDD-VEFVVGAGSWNQG--EFNYLKDVQKNDATKVVNKKITLPOTGGIGTIIFAV
ORF4_23FTW	AKLGD-VKFEVGAGSWNQG--DFNYLKDVQKNDATKVVNKKITLPOTGGIGTIIFAV
ORF4_19FTW	ALLTSRQKFEVTATSYSATGQIEYTAGSGKDDATKVVNKKITLPOTGGIGTIIFAV
ORF4_9VSP	ALLTSRQKFEVTATSYSATGQIEYTAGSGKDDATKVVNKKITLPOTGGIGTIIFAV
ORF4_TIGR	ALLTSRQKFEVTATSYSATGQIEYTAGSGKDDATKVVNKKITLPOTGGIGTIIFAV

\*:\* : . :\* \* \* \* : . ::\* . \* :\*\*\*\*\*

ORF4_6BF	AGAAIMGIAVYAYVKNNKDEDQLA
ORF4_6BSP	AGAAIMGIAVYAYVKNNKDEDQLA
ORF4_670	AGAAIMGIAVYAYVKNNKDEDQLA
ORF4_14CSR	AGAAIMGIAVYAYVKNNKDEDQLA
ORF4_19AH	AGAAIMGIAVYAYVKNNKDEDQLA
ORF4_23FP	AGAVIMGIAVYAYVKNNKDEDQLA
ORF4_23FTW	AGAVIMGIAVYAYVKNNKDEDQLA
ORF4_19FTW	AGAVIMGIAVYAYVKNNKDEDQLA
ORF4_9VSP	AGAVIMGIAVYAYVKNNKDEDQLA
ORF4_TIGR	AGAAIMGIAVYAYVKNNKDEDQLA

\*\*\* . \*\*\*\*\*



## Figure 144A

ORF5\_6BSP -----MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV  
ORF5\_TIGR -----MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV  
ORF5\_6BF -----MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV  
ORF5\_670 -----MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV  
ORF5\_19AH -----MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV  
ORF5\_14CSR -----MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV  
ORF5\_19FTW -----MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV  
ORF5\_23FTW -----MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV  
ORF5\_9VSP MTMQKMQKMQKMQKMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV  
ORF5\_23FP -----MTMQKMQKMISRIFFVMALCFSLVWGAHAVQAQEDHTLVLQLENYQEV  
\*\*\*\*\*

ORF5\_6BSP VSQPSRDGHRQLQVWKLDDSYSDRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV  
ORF5\_TIGR VSQPSRDGHRQLQVWKLDDSYSDRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV  
ORF5\_6BF VSQPSRDGHRQLQVWKLDDSYSDRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV  
ORF5\_670 VSQPSRDGHRQLQVWKLDDSYSDRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV  
ORF5\_19AH VSQPSRDGHRQLQVWKLDDSYSDRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV  
ORF5\_14CSR VSQPSRDGHRQLQVWKLDDSYSDRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV  
ORF5\_19FTW VSQPSRDGHRQLQVWKLDDSYSDNRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV  
ORF5\_23FTW VSQPSRDGHRQLQVWKLDDSYSDNRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV  
ORF5\_9VSP VSQPSRDGHRQLQVWKLDDSYSDNRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV  
ORF5\_23FP VSQPSRDGHRQLQVWKLDDSYSDNRVQIVRDLHSWDENKLSSFKKTSFEMTFLENQIEV  
\*\*\*\*\*

ORF5\_6BSP SHIPNGLYYVRSIIQTDVSYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH  
ORF5\_TIGR SHIPNGLYYVRSIIQTDVSYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH  
ORF5\_6BF SHIPNGLYYVRSIIQTDVSYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH  
ORF5\_670 SHIPNGLYYVRSIIQTDVSYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH  
ORF5\_19AH SHIPNGLYYVRSIIQTDVSYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH  
ORF5\_14CSR SHIPNGLYYVRSIIQTDVSYPAEFLFEMTDQTVPLVIVAKKTDMTTKVKLIKVDQDH  
ORF5\_19FTW SHIPNGLYYVRSIIQTDVSYPAEFLFEMTDQTVPLVIVAKKADTVTTKVLIKVDQDH  
ORF5\_23FTW SHIPNGLYYVRSIIQTDVSYPAEFLFEMTDQTVPLVIVAKKADTVTTKVLIKVDQDH  
ORF5\_9VSP SHIPNGLYYVRSIIQTDVSYPAEFLFEMTDQTVPLVIVAKKADTVTTKVLIKVDQDH  
ORF5\_23FP SHIPNGLYYVRSIIQTDVSYPAEFLFEMTDQTVPLVIVAKKADTVTTKVLIKVDQDH  
\*\*\*\*\*

ORF5\_6BSP NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVVTNLPLGNYRF  
ORF5\_TIGR NRLEGVGFKLVSVARDVSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVVTNLPLGNYRF  
ORF5\_6BF NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVVTNLPLGNYRF  
ORF5\_670 NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVVTNLPLGNYRF  
ORF5\_19AH NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVVTNLPLGNYRF  
ORF5\_14CSR NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVVTNLPLGNYRF  
ORF5\_19FTW NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVVTNLPLGTYRF  
ORF5\_23FTW NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVVTNLPLGTYRF  
ORF5\_9VSP NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVVTNLPLGTYRF  
ORF5\_23FP NRLEGVGFKLVSVARDGSEKEVPLIGEYRYSSSGQVGRITLYTDKNGEIVVTNLPLGTYRF  
\*\*\*\*\*

ORF5\_6BSP KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV  
ORF5\_TIGR KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV  
ORF5\_6BF KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV  
ORF5\_670 KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV  
ORF5\_19AH KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV  
ORF5\_14CSR KEVEPLAGYAVTTLDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV  
ORF5\_19FTW KEVEPLAGYTVTTMDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV  
ORF5\_23FTW KEVEPLAGYTVTTMDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV  
ORF5\_9VSP KEVEPLAGYTVTTMDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV  
ORF5\_23FP KEVEPLAGYAVTTMDTDVQLVDHQLVTITVVNQKLPRGNVDFMKVDGRTNTSLQGAMFKV  
\*\*\*\*\*



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## Figure 144B

ORF5_6BSP	MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLEYG	WELQAPTCYVOLTSPVSFTI
ORF5_TIGR	MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLEYG	WELQAPTCYVOLTSPVSFTI
ORF5_6BF	MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLEYG	WELQAPTCYVOLTSPVSFTI
ORF5_670	MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLEYG	WELQAPTCYVOLTSPVSFTI
ORF5_19AH	MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLEYG	WELQAPTCYVOLTSPVSFTI
ORF5_14CSR	MKEESGHYTPVLQNGKEVVVTSGKDGRFRVEGLEYG	WELQAPTCYVOLTSPVSFTI
ORF5_19FTW	MKEENGHYTPVLQNGKEVVVASGKDGRFRVEGLEYG	WELQAPTCYVOLTSPVSFTI
ORF5_23FTW	MKEENGHYTPVLQNGKEVVVASGKDGRFRVEGLEYG	WELQAPTCYVOLTSPVSFTI
ORF5_9VSP	MKEENGHYTPVLQNGKEVVVASGKDGRFRVEGLEYG	WELQAPTCYVOLTSPVSFTI
ORF5_23FP	MKEENGHYTPVLQNGKEVVVASGKDGRFRVEGLEYG	WELQAPTCYVOLTSPVSFTI

\*\*\*\*.\*\*\*\*\*:\*\*\*\*\*

ORF5_6BSP	GKDTRKELVTVVKNNKRPRIDV	PDTCGEETLYILMLVAILLFGSGYYLT	KKPNN
ORF5_TIGR	GKDTRKELVTVVKNNKRPRIDV	PDTCGEETLYILMLVAILLFGSGYYLT	KKPNN
ORF5_6BF	GKDTRKELVTVVKNNKRPRIDV	PDTCGEETLYILMLVAILLFGSGYYLT	KKPNN
ORF5_670	GKDTRKELVTVVKNNKRPRIDV	PDTCGEETLYILMLVAILLFGSGYYLT	KKPNN
ORF5_19AH	GKDTRKELVTVVKNNKRPRIDV	PDTCGEETLYILMLVAILLFGSGYYLT	KKPNN
ORF5_14CSR	GKDTRKELVTVVKNNKRPRIDV	PDTCGEETLYILMLVAILLFGSGYYLT	KKPNN
ORF5_19FTW	GKDTRKELVTVVKNNKRPRIDV	PDTCGEETLYILMLVAILLFGSGYYLT	KKKTNN
ORF5_23FTW	GKDTRKELVTVVKNNKRPRIDV	PDTCGEETLYILMLVAILLFGSGYYLT	KKKTNN
ORF5_9VSP	GKDTRKELVTVVKNNKRPRIDV	PDTCGEETLYILMLVAILLFGSGYYLT	KKKTNN
ORF5_23FP	GKDTRKELVTVVKNNKRPRIDV	PDTCGEETLYILMLVAILLFGSGYYLT	KKKTNN

\*\*\*\*\*. \*\*



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## Figure 145A

ORF6_23FTW	MLIKMVKTKKQKRNNLLLGVVFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_TIGR	MLIKMVKTKKQKRNNLLLGVVFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_6BSP	MLIKMVKTKKQKRNNLLLGVVFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_6BF	MLIKMVKTKKQKRNNLLLGVVFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_670	MLIKMVKTKKQKRNNLLLGVVFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_19AH	MLIKMVKTKKQKRNNLLLGVVFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_14CSR	MLIKMVKTKKQKRNNLLLGVVFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_23FP	MLIKMAKTKKQKRNNLLLGVVFFIGIAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_9VSP	MLIKMAKTKKQKRNNLLLGVVFFIGIAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
ORF6_19FTW	MLIKMAKTKKQKRNNLLLGVVFFIGMAVMAYPLVSRLYYRVESNQQIADFDKEKATLDEA
	*****:*****
ORF6_23FTW	DIDERMKLAQAFNDLNNVVSGBPWEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_TIGR	DIDERMKLAQAFNDLNNVVSGBPWEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_6BSP	DIDERMKLAQAFNDLNNVVSGBPWEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_6BF	DIDERMKLAQAFNDLNNVVSGBPWEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_670	DIDERMKLAQAFNDLNNVVSGBPWEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_19AH	DIDERMKLAQAFNDLNNVVSGBPWEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_14CSR	DIDERMKLAQAFNDLNNVVSGBPWEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_23FP	DIDERMKLAQAFNDLNNVVSGBPWEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_9VSP	DIDERMKLAQAFNDLNNVVSGBPWEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
ORF6_19FTW	DIDERMKLAQAFNDLNNVVSGBPWEEMKKKGRAEYARMLEIHERMGHVEIPVIDVDLP
	*****:*****
ORF6_23FTW	VYAGTAEVLQQGAGGLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLVGDKFYVH
ORF6_TIGR	VYAGTAEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLVGDKFYVH
ORF6_6BSP	VYAGTAEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLVGDKFYVH
ORF6_6BF	VYAGTAEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLVGDKFYVH
ORF6_670	VYAGTAEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLVGDKFYVH
ORF6_19AH	VYAGTAEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLVGDKFYVH
ORF6_14CSR	VYAGTAEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLVGDKFYVH
ORF6_23FP	VYAGTAEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLVGDKFYVH
ORF6_9VSP	VYAGTAEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLVGDKFYVH
ORF6_19FTW	VYAGTAEVLQQGAGHLEGTSLPIGGNSTHAVITAHTGLPTAKMFTDLTKLVGDKFYVH
	*****:*****
ORF6_23FTW	NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLLRGHRIPYVAE
ORF6_TIGR	NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLLRGHRIPYVAE
ORF6_6BSP	NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLLRGHRIPYVAE
ORF6_6BF	NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLLRGHRIPYVAE
ORF6_670	NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLLRGHRIPYVAE
ORF6_19AH	NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLLRGHRIPYVAE
ORF6_14CSR	NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLLRGHRIPYVAE
ORF6_23FP	NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLLRGHRIPYVAE
ORF6_9VSP	NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLLRGHRIPYVAE
ORF6_19FTW	NIKEVMAYQVDQVKVIEPTNFDDLLIVPGHDYVTLTCTPYMINTHRLLRGHRIPYVAE
	*****:*****
ORF6_23FTW	VEEFIAANKLSHLYRYLFYVAVGLIVILLWIIIRLRKKKKQPEKALKALKAAARKEVKVE
ORF6_TIGR	VEEFIAANKLSHLYRYLFYVAVGLIVILLWIIIRLRKKKKQPEKALKALKAAARKEVKVE
ORF6_6BSP	VEEFIAANKLSHLYRYLFYVAVGLIVILLWIIIRLRKKKKQPEKALKALKAAARKEVKVE
ORF6_6BF	VEEFIAANKLSHLYRYLFYVAVGLIVILLWIIIRLRKKKKQPEKALKALKAAARKEVKVE
ORF6_670	VEEFIAANKLSHLYRYLFYVAVGLIVILLWIIIRLRKKKKQPEKALKALKAAARKEVKVE
ORF6_19AH	VEEFIAANKLSHLYRYLFYVAVGLIVILLWIIIRLRKKKKQPEKALKALKAAARKEVKVE
ORF6_14CSR	VEEFIAANKLSHLYRYLFYVAVGLIVILLWIIIRLRKKKKQPEKALKALKAAARKEVKVE
ORF6_23FP	VEEFIAANKLSHLYRYLFYVAVGLIVILLWIIIRLRKKKKQSERALKALKEATKEVKVE
ORF6_9VSP	VEEFIAANKLSHLYRYLFYVAVGLIVILLWIIIRLRKKKKQSERALKALKEATKEVKVE
ORF6_19FTW	VEEFIAANKLSHLYRYLFYVAVGLIVILLWIIIRLRKKKKQSERALKALKEATKEVKVE
	*****:*****



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## Figure 145B

ORF6_23FTW	DGQQ
ORF6_TIGR	DGQQ
ORF6_6BSP	DGQQ
ORF6_6BF	DGQQ
ORF6_670	DGQQ
ORF6_19AH	DGQQ
ORF6_14CSR	DGQQ
ORF6_23FP	DE--
ORF6_9VSP	DE--
ORF6_19FTW	DE-

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ORF7_14CSR	TAPIAERNRAVRERGGQFWLWLLLAALVMILVLSYGVYRHRRIVKGLEKQLEEHHVKG
ORF7_19AH	TAPIAERNRAVRERGGQFWLWLLLAALVMILVLSYGVYRHRRIVKGLEKQLEEHHVKG
ORF7_6BF	TAPIAERNRAVRERGGQFWLWLLLAALVMILVLSYGVYRHRRIVKGLEKQLEEHHVKG
ORF7_6BSP	TAPIAERNRAVRERGGQFWLWLLLAALVMILVLSYGVYRHRRIVKGLEKQLEEHHVKG
ORF7_670	TAPIAERNRAVRERGGQFWLWLLLAALVMILVLSYGVYRHRRIVKGLEKQLEEHHVKG
ORF7_23FTW	TAPIAERNRAVRERGGQFWLWLLLAALVMILVLSYGVYRHRRIVKGLEKQLEEHHVKG
ORF7_23FP	TAPIAERNRAVRERGGQFWLWLLLGAMAVILLLLYRVYRNRRIVKGLEKQLEGRHVKD
ORF7_9VSP	TAPIAERNRAVRERGGQFWLWLLLGAMAVILLLLYRVYRNRRIVKGLEKQLEGRHVKD
ORF7_19FTW	TAPIAERNRAVRERGGQFWLWLLLGAMAVILLLLYRVYRNRRIVKGLEKQLEGRHVKD
ORF7_TIGR	TAPIAERNRAVRERGGQFWLWLLLGAMAVILLLLYRVYRNRRIVKGLEKQLEGRHVKD



Figure 147

```

ORF8_14CSR      FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
ORF8_19AH       FTKEGQSVSRVATSQWLYRGLVVLAFMGILFVLWKLARLLRGK
ORF8_23FTW      FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
ORF8_670        FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
ORF8_6BF        FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
ORF8_6BSP       FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
ORF8_19FTW      FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
ORF8_23FP       FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
ORF8_9VSP       FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
ORF8_TIGR       FTKEGQSVSRVATSQWLYRGLVVLAFGLGILFVLWKLARLLRGK
*****

```

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# RrgA, LPXTG

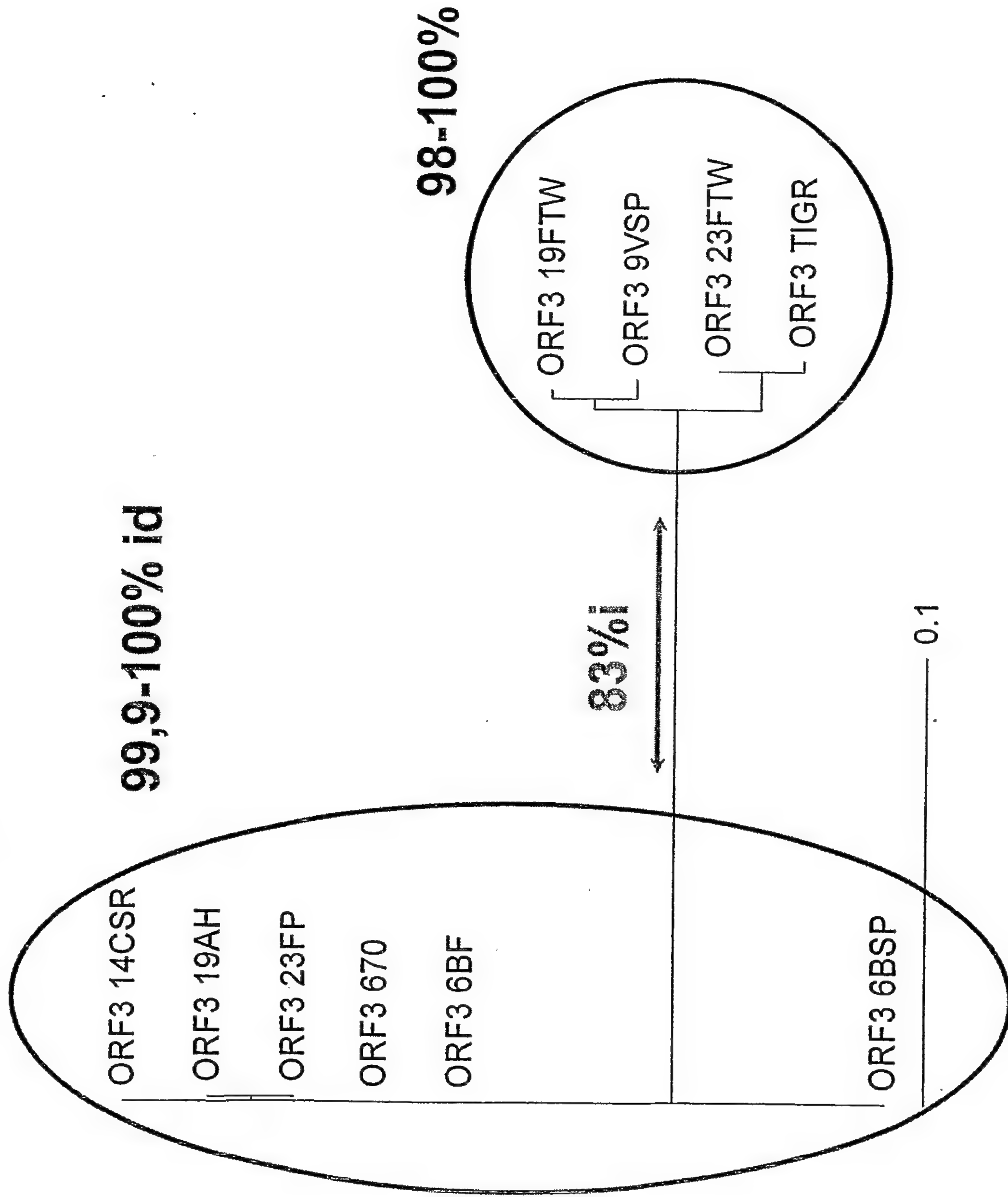


Figure 148



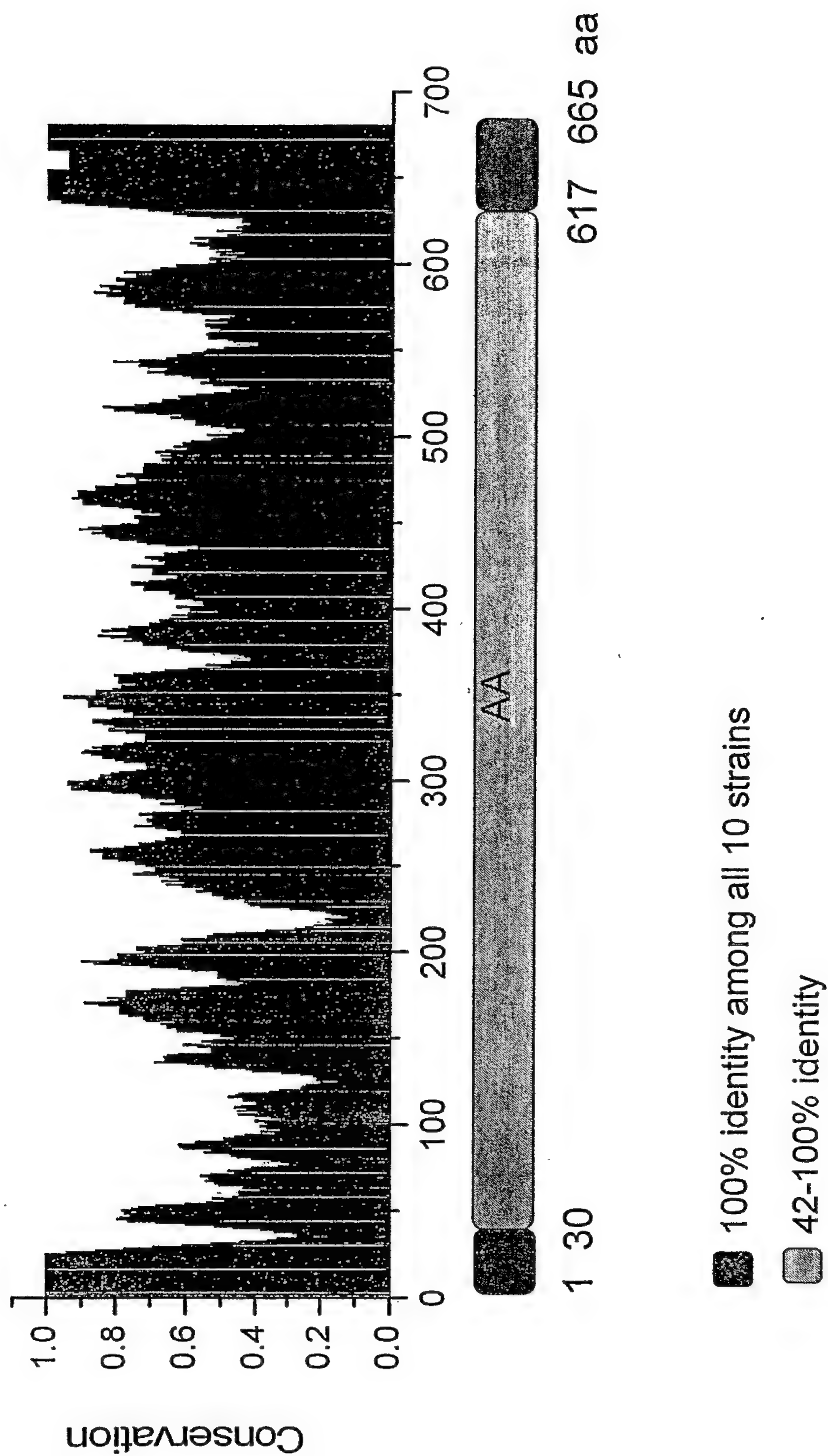


Figure 149

A

MLNRETHMKVKRIFQKAVAGLCCISQLTAFSSIVALA\*ETPETS~~PAIGKVV~~IKETGEGGALLGDAVFELKN  
 NTDGTTVSQRTEAQTGEAIFSNIKPGTYTLTEAQPVGYPSTKQWTVVEKNGRTTVQGEQVENREE  
 ALSDQYPQTGTYPDVQTPYQIIKVDGSEKNGQHKA~~LNPNP~~YERVIPEGTL~~SKRIYQVNNLDDN~~QYGIEL  
 TVSGKTVYEQDKSVPLDVVILLDNSMSNIRNKNARRAERAGEATRS~~LIDKIT~~SDSEN~~RVAL~~VTYAS  
 TIFDGTFTVEKGVADKNGKRLNDSLFWN~~YDQTSFT~~TNTKDYSLKLTNDKNDIVELKNKVPTEAEDHD  
 GNRLMYQFGATFTQKALMKADEILTQ~~QARQNSQK~~VIFHITDGVPTMSYPINFNHA~~TF~~APSYQNQLNA  
 FFSKSPNKDGILLSDFITQATSGEHTIVRGDGGQSYQMFTDKTVYEKGAPAAFPVKPEKYSEMKAAGYAVI  
 GDPINGGYIWLNWRESILAYPENSNTAKITNHGDPTRWY~~YNGNI~~APDGYDVFTVGIGINGDPGTDEATA  
 TSFMSISSKPENYTNVTD~~TTKILEQ~~LNRYFHTIVTEKKSIENGTTIDPMGELIDLQLGTDGRFDPADYTL  
 TANDGSRLENGQAVGGPQNDGGLLKNAKVL~~YDTTEKRIR~~VTGLYLGTDEKVTLTYNVRLNDEFVSNKFYD  
 TNGR~~TTLHPKEVEQNTVRDFFPKIRD~~VRKYPEITISKEKKLG~~DIEFIK~~VNKN~~DKKPLRGA~~VFSLQKQHPDY  
 DIYG~~AIDQNGTYQNVRTGEDGKLTFKNLSDGKYRL~~FENSEPAGYKPVQNKPIVAFQIVNGEVRDVT~~SIVPQ~~  
 DIPAGYEFTNDKH~~YITNEPIPPKREY~~PR~~TGGIGMLPFYLIGCMM~~MGVLLYTRKHP

B

5' cgggatcc-gaa-acg-cct-gaa-acc-agt 5' 24mer, 54 %G+C, Tm 62

*Bam*HI

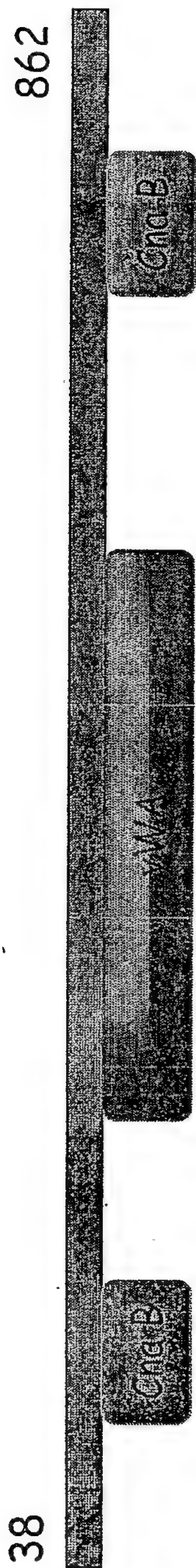
3' ccgctcgag-aat-agg-ttc-att-ggt 3' 27mer, 52 %G+C, Tm 61.6

*Xho*I

Figure 150



A.



B.

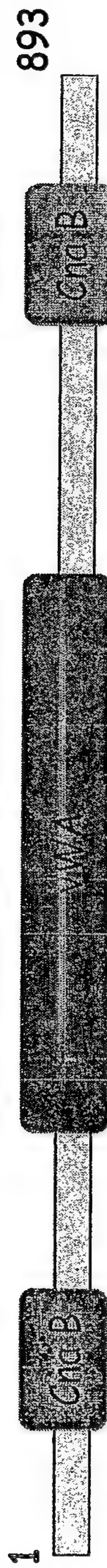
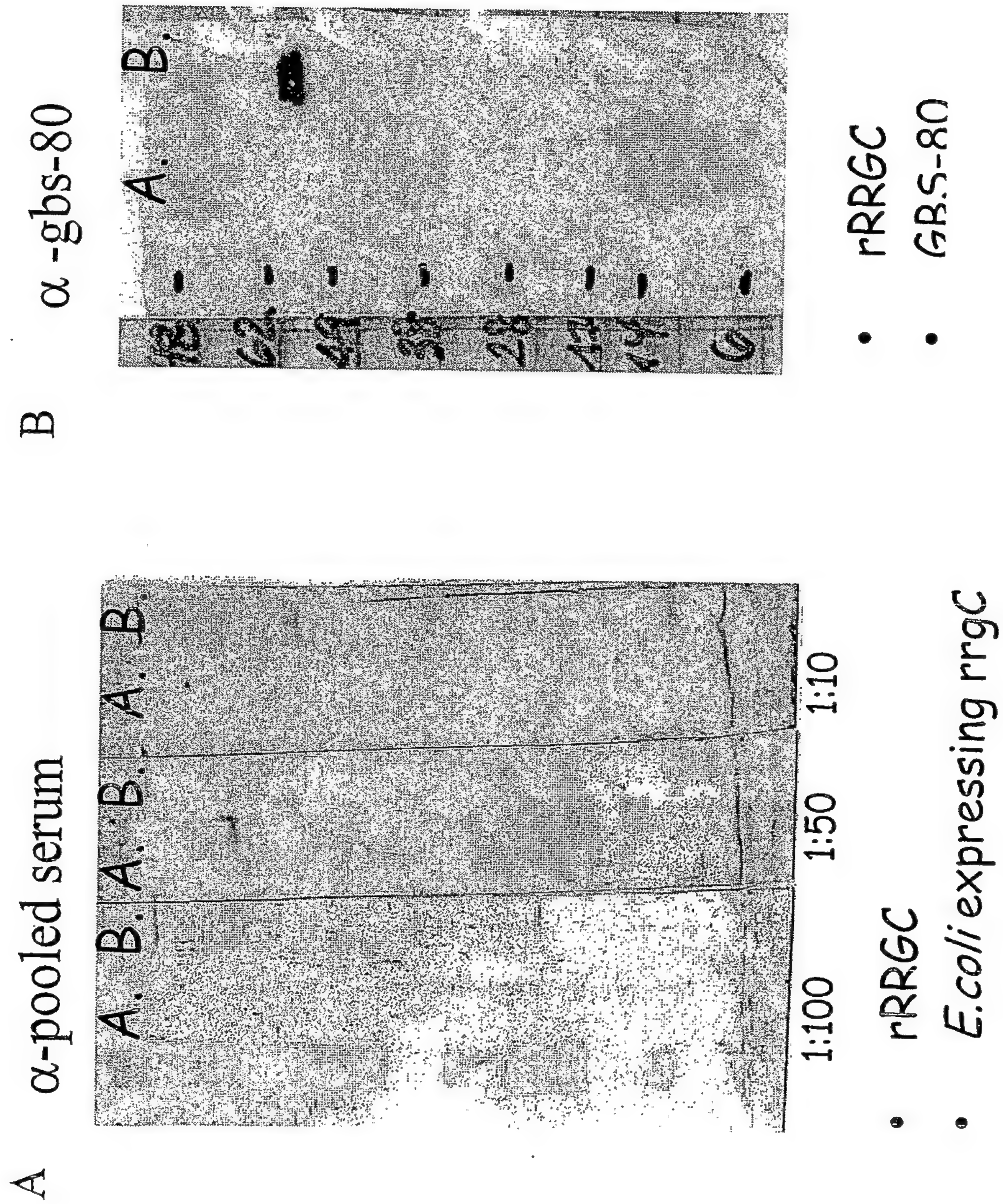


Figure 151

Figure 152





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A

MKSINKFLTMLAALLLTASSLFS\*AATVFAAGTTTTSVTVHKLLATDGDMDKIANELETGNYAGNKVGVLPPA  
 NAKEIAGVMFVWNTNTNNEIDENGQTLGVNIDPQTFKLSGAMPATAMKKLTEAEGAKFNTANLPAKYKIY  
 EHSLSYVGEDGATLTGSKAVPIEIELPLNDVVDAAHVYPKNTAKPKIDKDFKGNPDTPRVDKDTPVNHQV  
 GDVVEYEIVTKIPALANYATANWSDRMTEGLAFNKGTVKVTVDVVALEAGDYALTEVATGFDLKLTDAGLAK  
 VNDQNAEKTIVKITYSATLNDKAIVEVPESNDVTFNYGNNPDHGNTPKPNKNENGDLTLTKTWVDTATGAPIP  
 AGAEATFDLVNAQTGKVVQTVTLTTDKNTVTVNGLDKNTYKFVERSIKGYADYQEITTAGELAVKNWKD  
 ENPKPLDPTPEPKVVITYGKKFVKVNDKDNRLAGAEFVIANADNAGQYLARKADKVSQEEKQLVVTTKDALDRAV  
 AAYNALTAQQQTQQEKEKVDKAQAAYNAAVIAANNAFEWVADKDNENVVKLVSDAQGRFEITGLLAGTY  
 YLEETKQPAGYALLTSRQKFEVTATSYSATGQGIEYTAGSGKDDATKVVNKKITIPQTGGIGTHFAVAGAAI  
 MGIAYYAYVKNKDEDEQLA

B

5' cgggaacc-gct-gca-aca-gtt-ttt 3' 23mer, 52.2% G+C, Tm 60.6  
*Bam*HI  
 5' ccgcctcgag-agt-gat-ttt-ttt-gtt-gac 3' 26mer, 44.4% G+C, Tm 61.7  
*Xho*I

Figure 153

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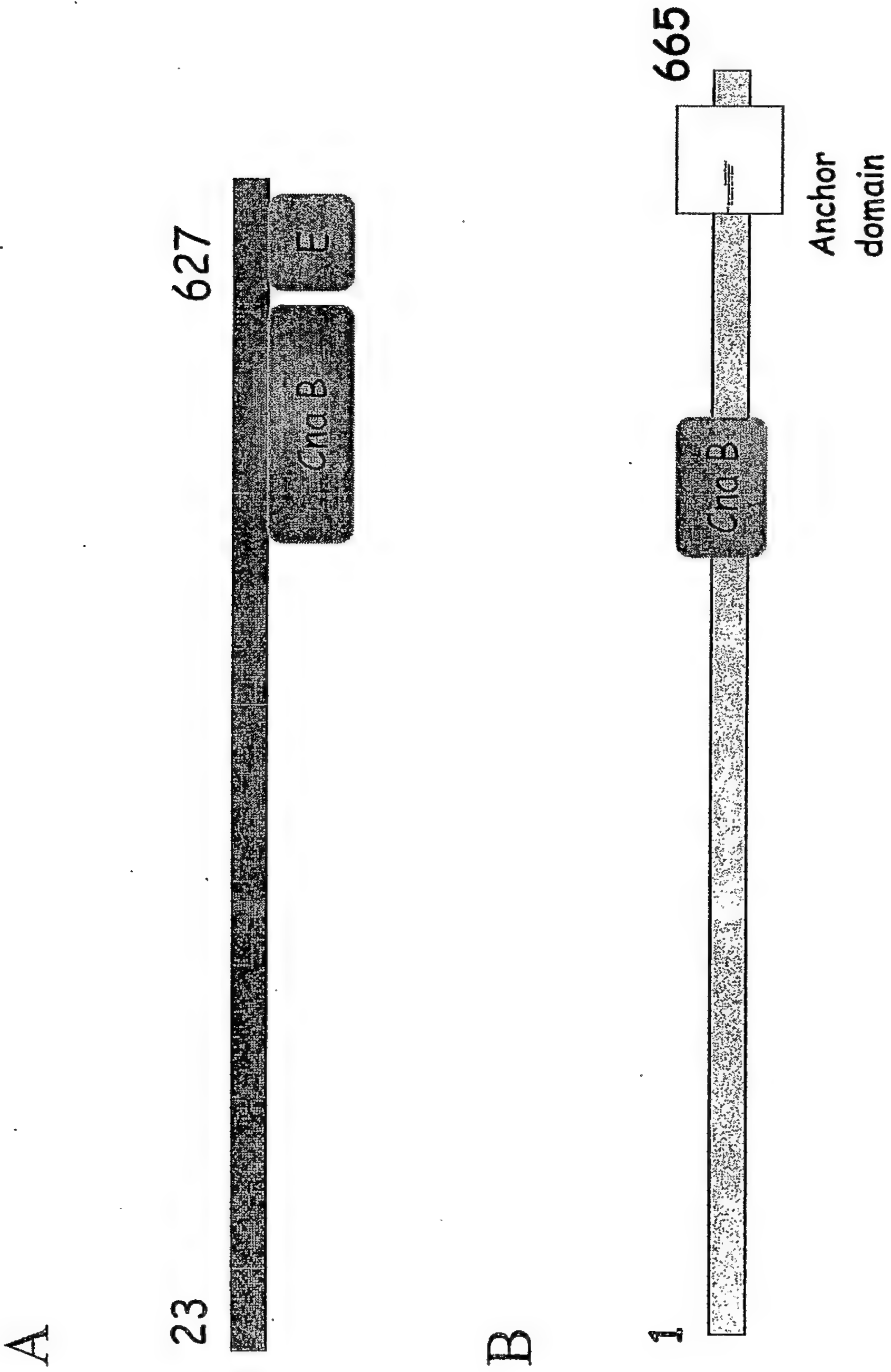


Figure 154



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60 kDa  
←

Figure 155

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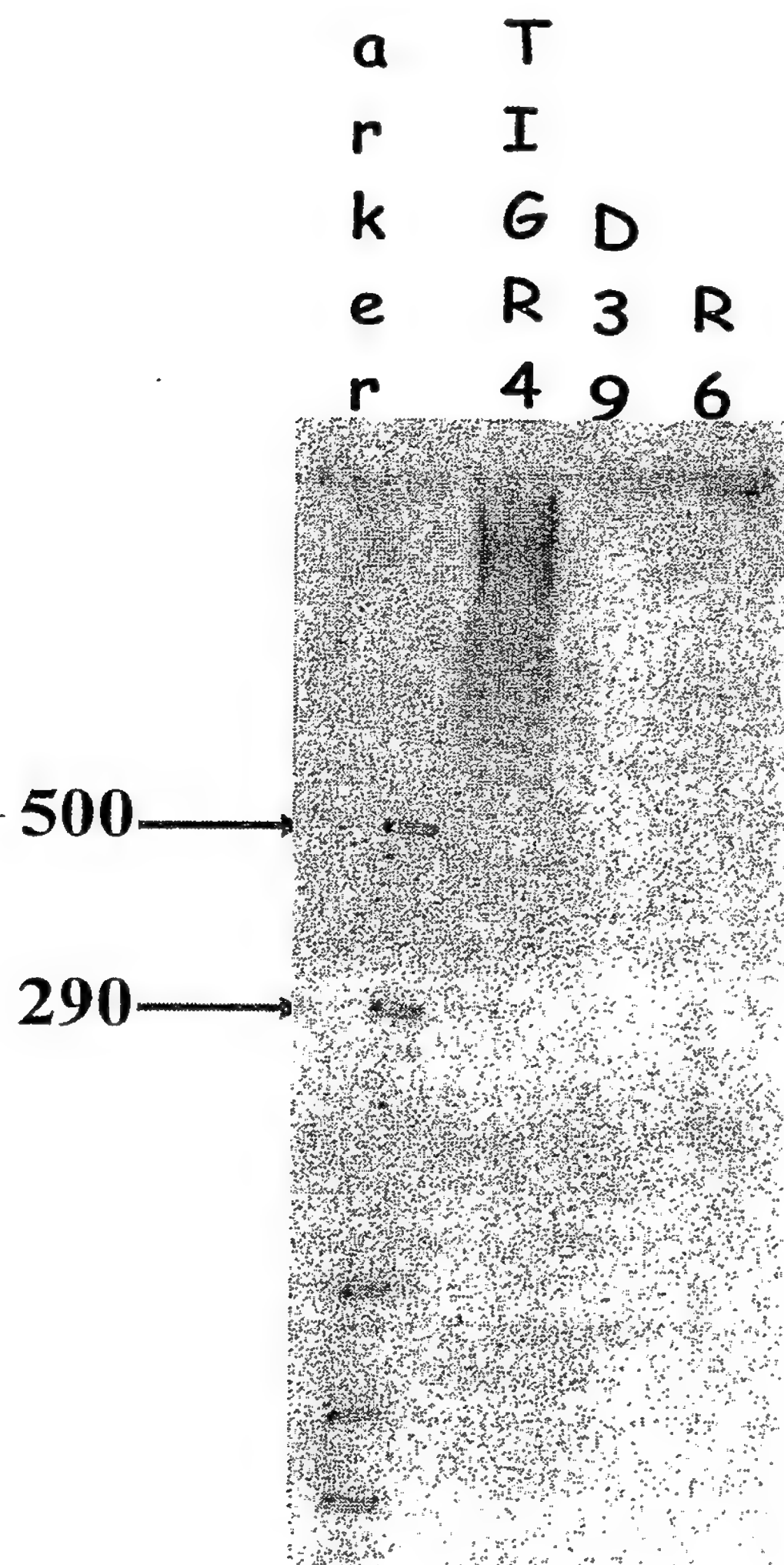


Figure 156



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A

MISRIFFVMALCFSLVWGA\*HAVAQAE~~DHTL~~VLQENYQEVVSQ~~PSRD~~GHRLQVWKLDDSYS  
 YDDR~~VQIV~~RDLHSWDENKLS~~FFK~~TSFEMTFLENQIEVSHIPNGLYYVRSIIQTD~~AVSYP~~AEFLF  
 EMTDQTVEPLVIVAKKTD~~MTTK~~VKLIKVDQDHNRL~~EGVG~~FKLVSVARDVSEKEVPLIGEYRYSS  
 GQVGR~~TL~~YTDKNGEIFVTNPLGNYR~~FKE~~VEPLAGYAVTTLDVQLVDHQLVT~~TTV~~VNQKLPRGN  
 VDFMKVDGR~~TNT~~SLQGAMFKVMKEESGHYTPVLQNGKEVV~~VTSG~~KDGRFRVEGLEYGTYLWELQ  
 APTGYVQLTSPVSFTIGKDTRKELVT~~VVKNNKRP~~RDVPDTGEETLYILMLVAILLFGSGYYLT~~TKKP~~  
 NN

B

5' cggaacc-cat-gca-gtc-caa-gcg-caa-gaa 21mer, 61% G+C, Tm 60.8

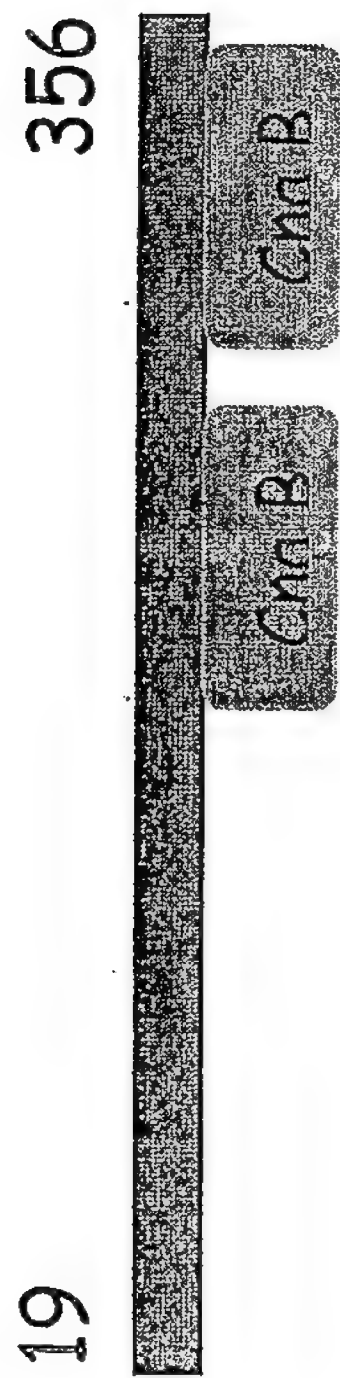
*Bam*HI

5' ccgcctcgag-ctt-gtt-att-ftt-aac-cac 27mer, 44% G+C, Tm 58.4

*Xho*I

Figure 157

A



B

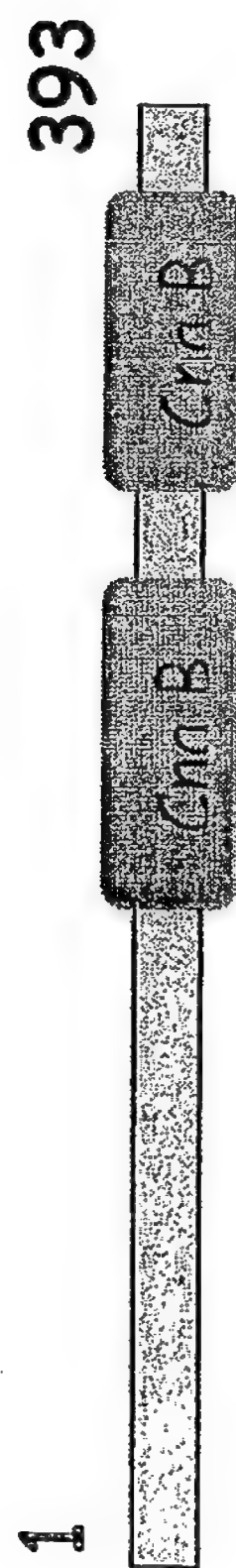


Figure 158



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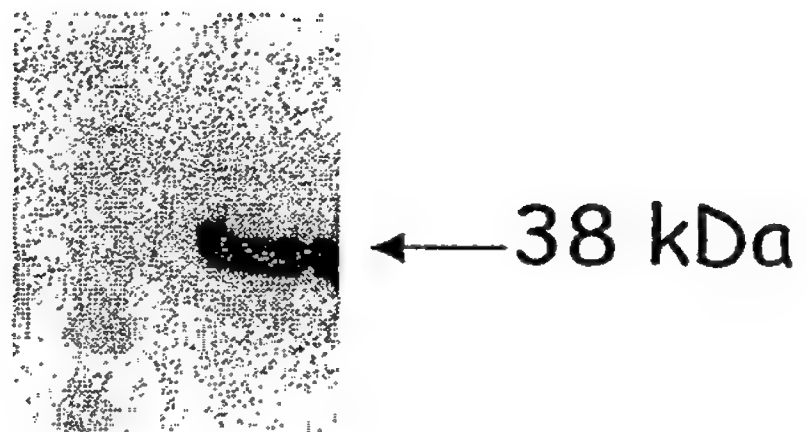


Figure 159

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	<i>rr</i>	<i>rr</i>	<i>rr</i>
	<i>g</i>	<i>g</i>	<i>g</i>
<i>M</i>	<i>A</i>	<i>B</i>	<i>C</i>

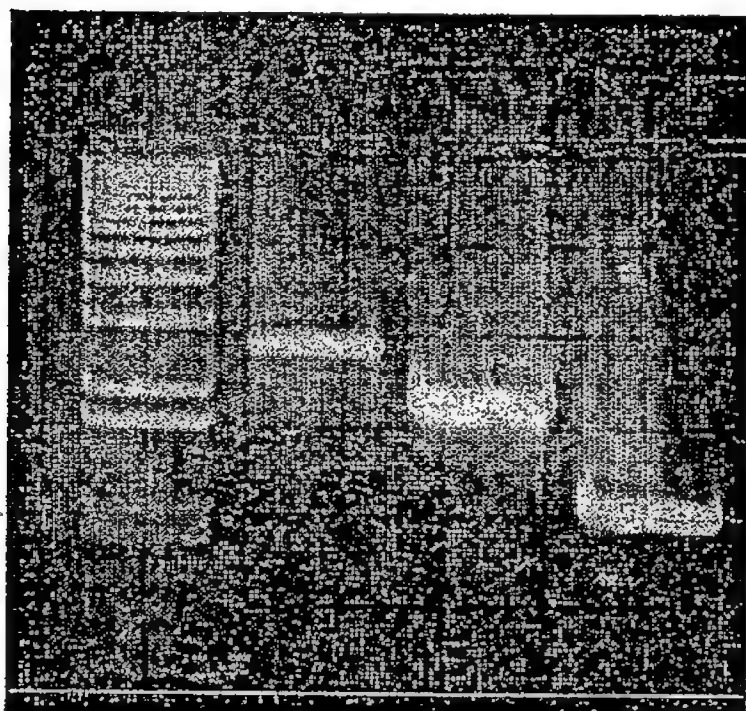
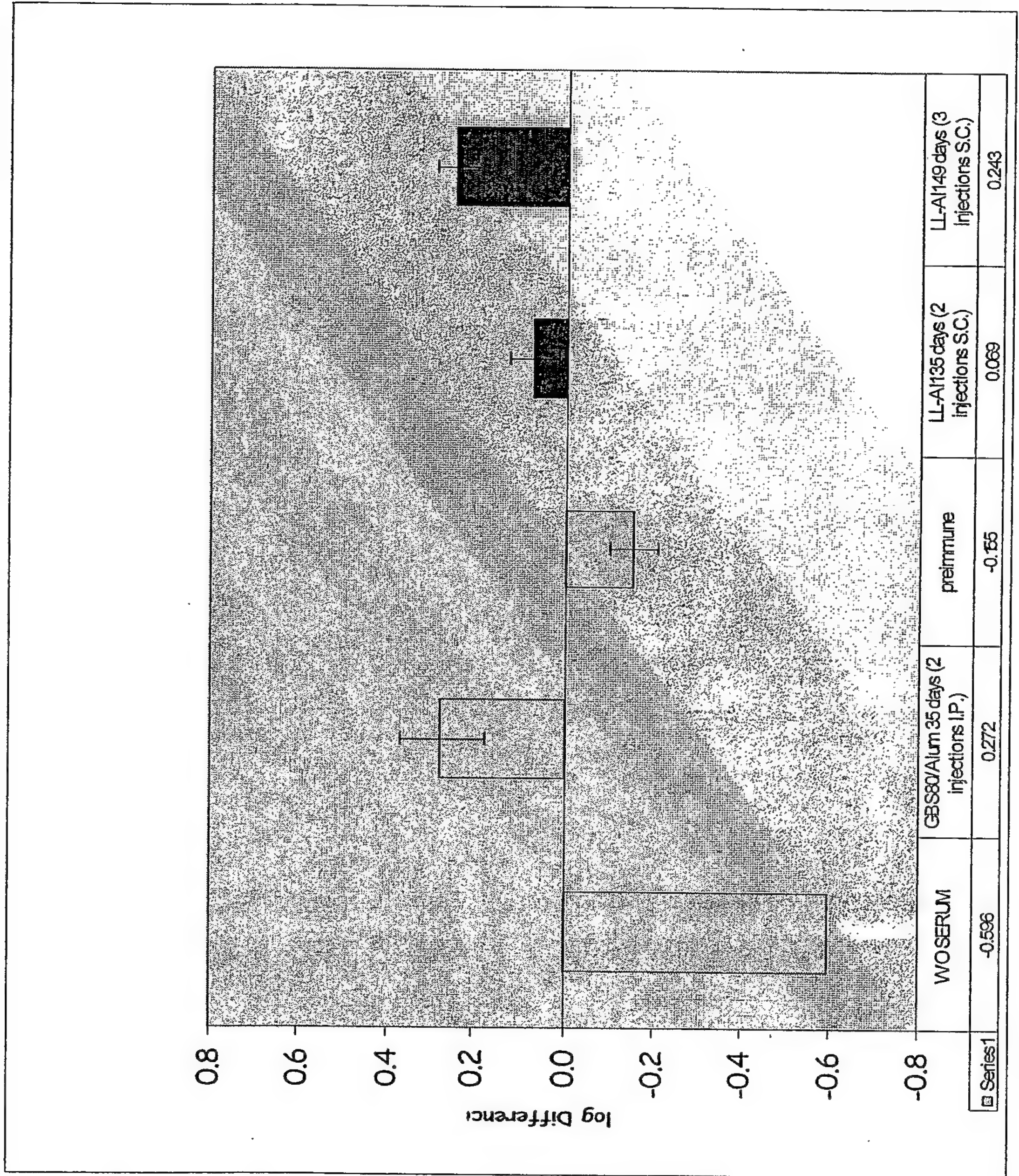


Figure 160



Figure 161



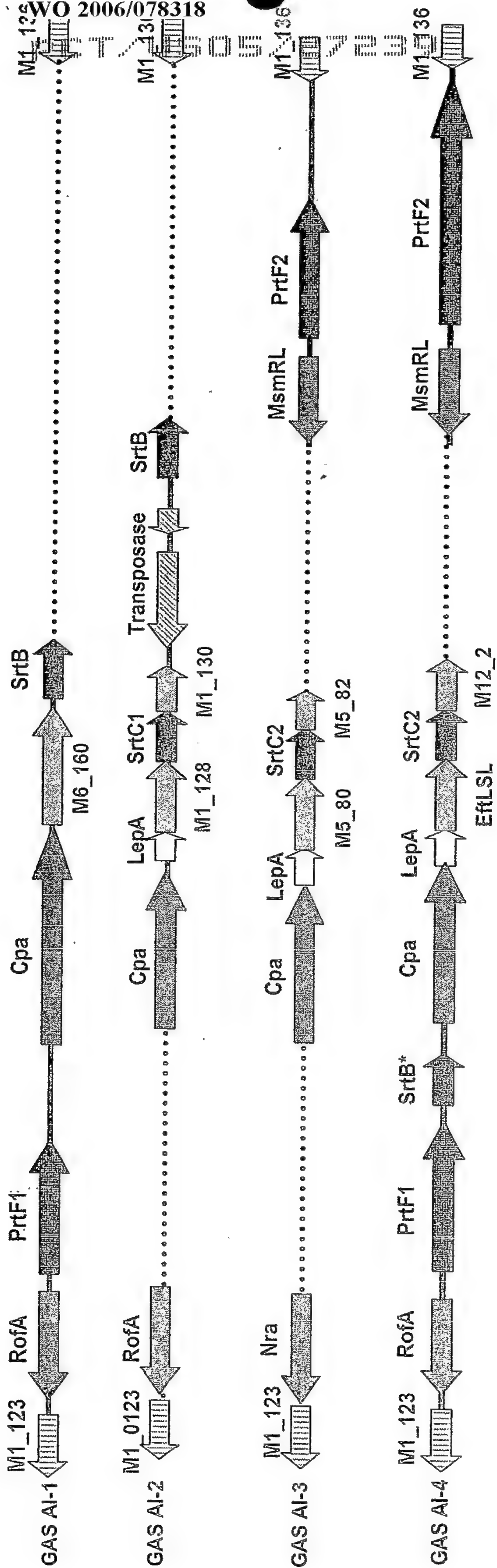
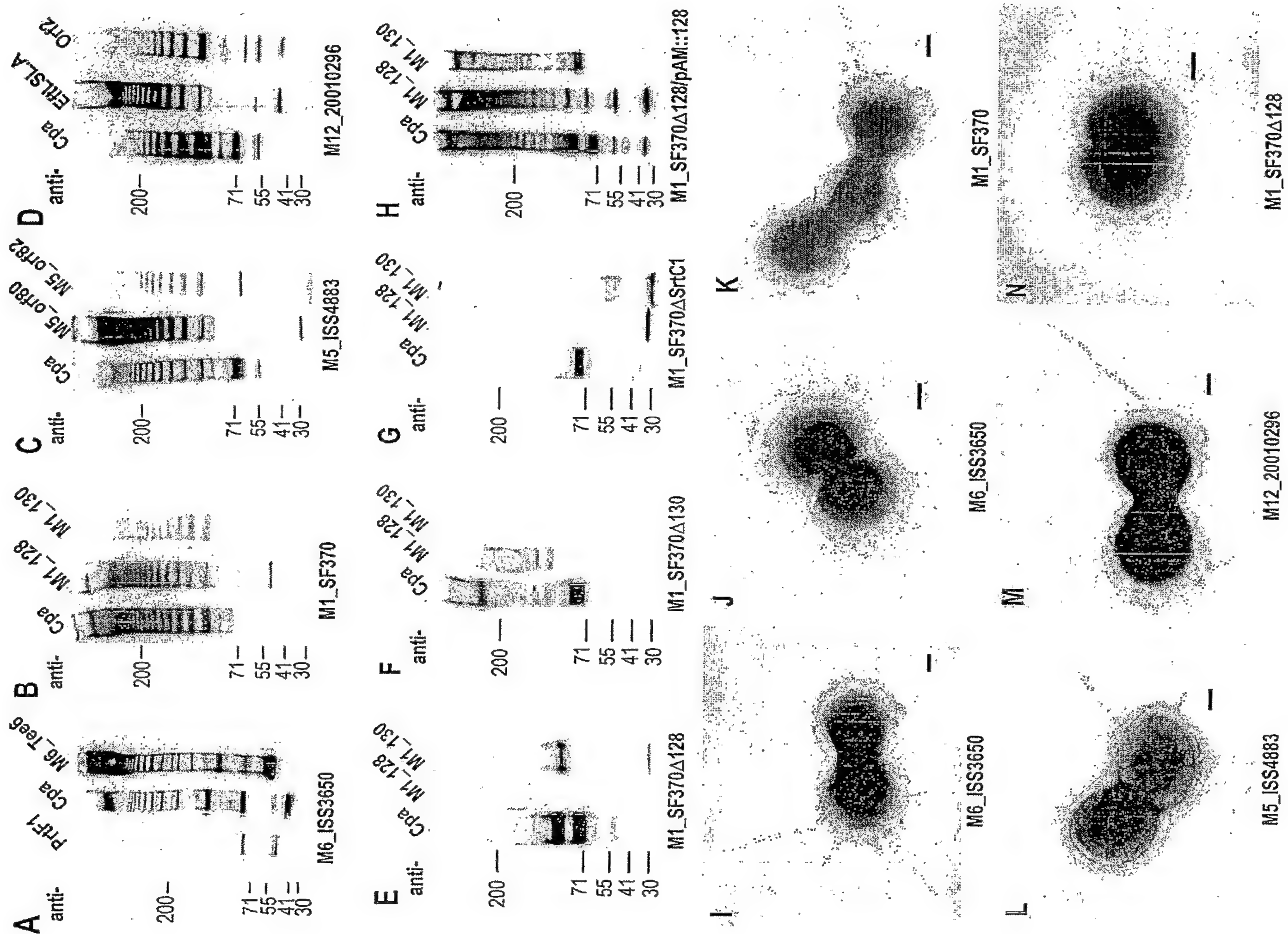


FIGURE 162



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Figure 163



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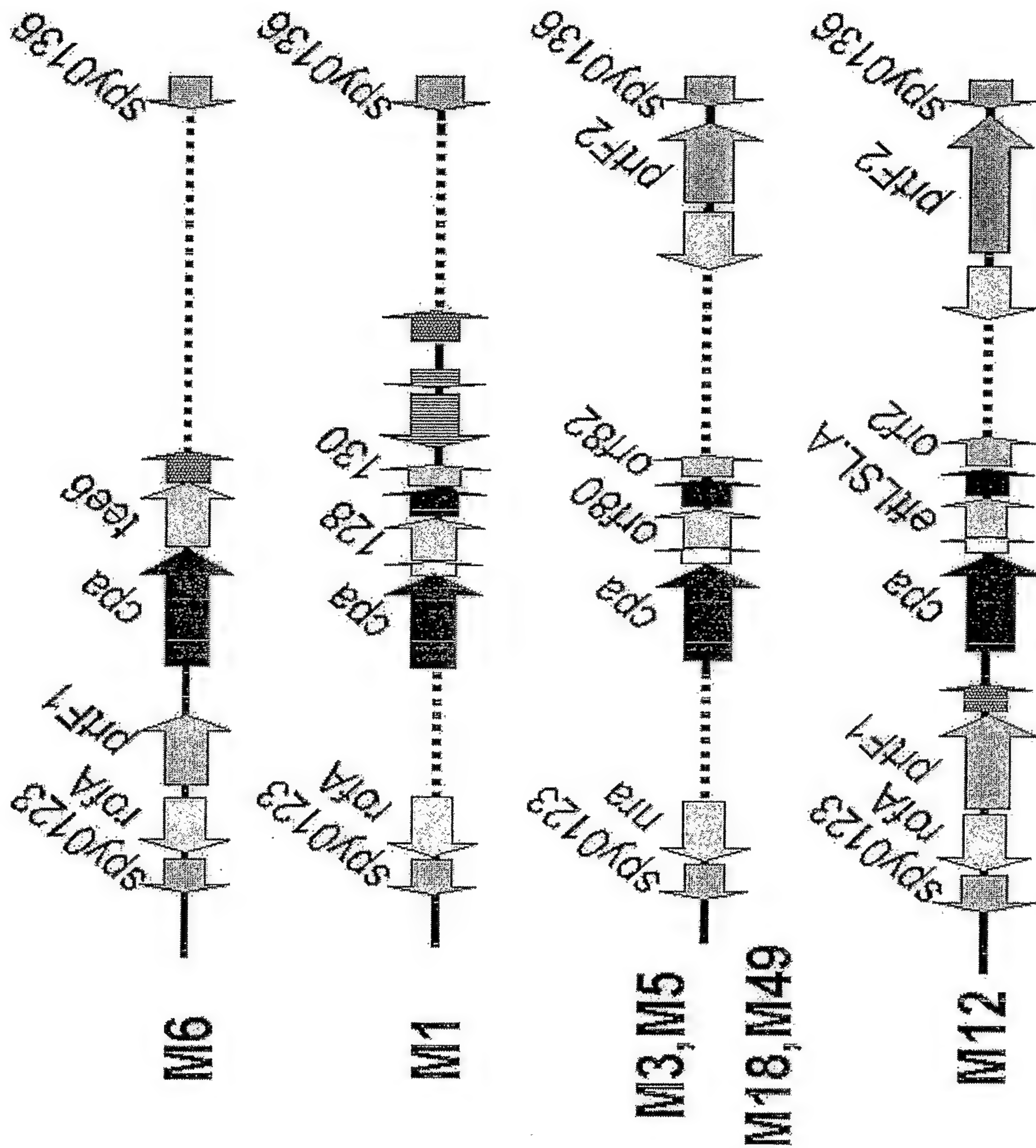


Figure 164



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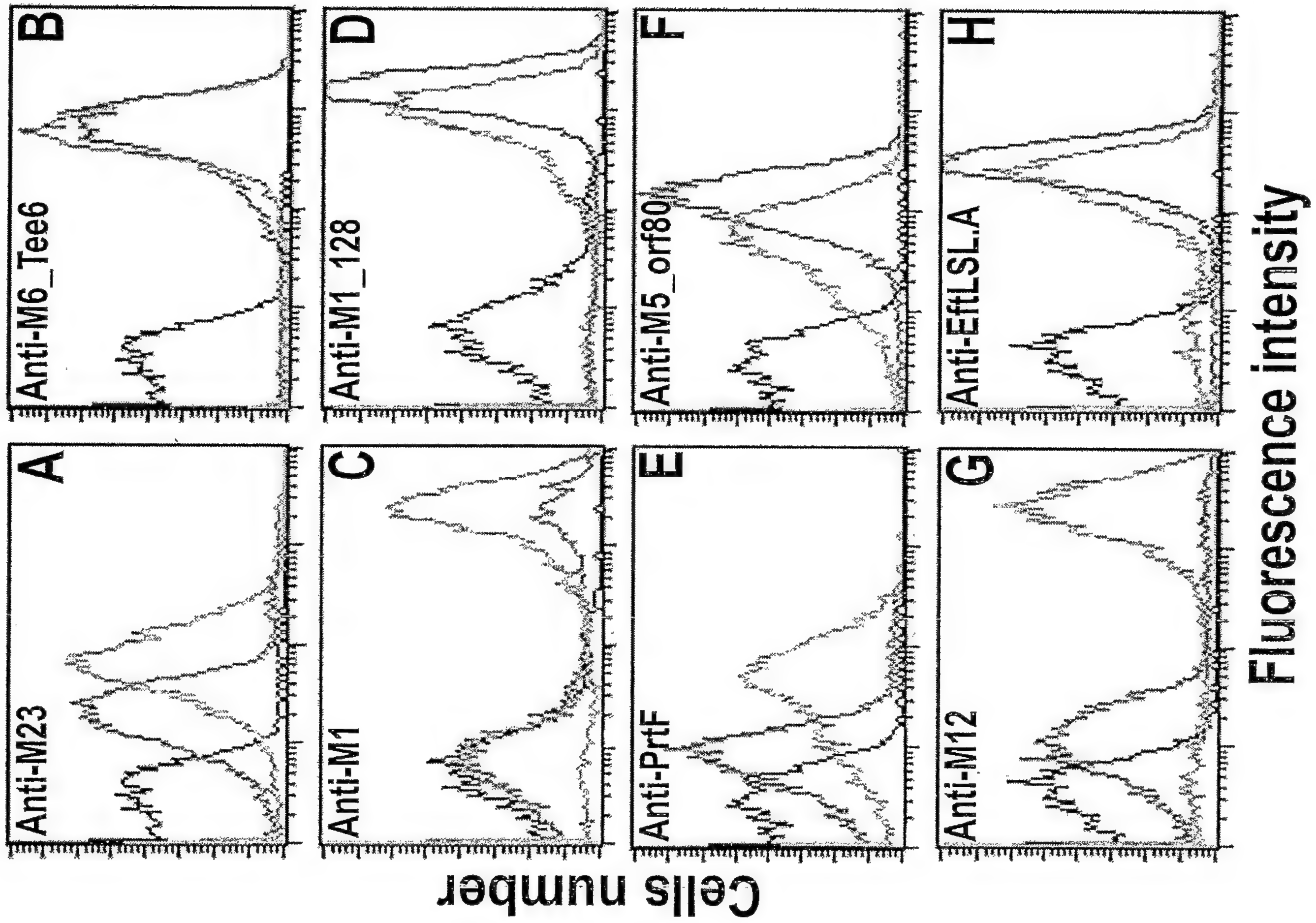


Figure 165

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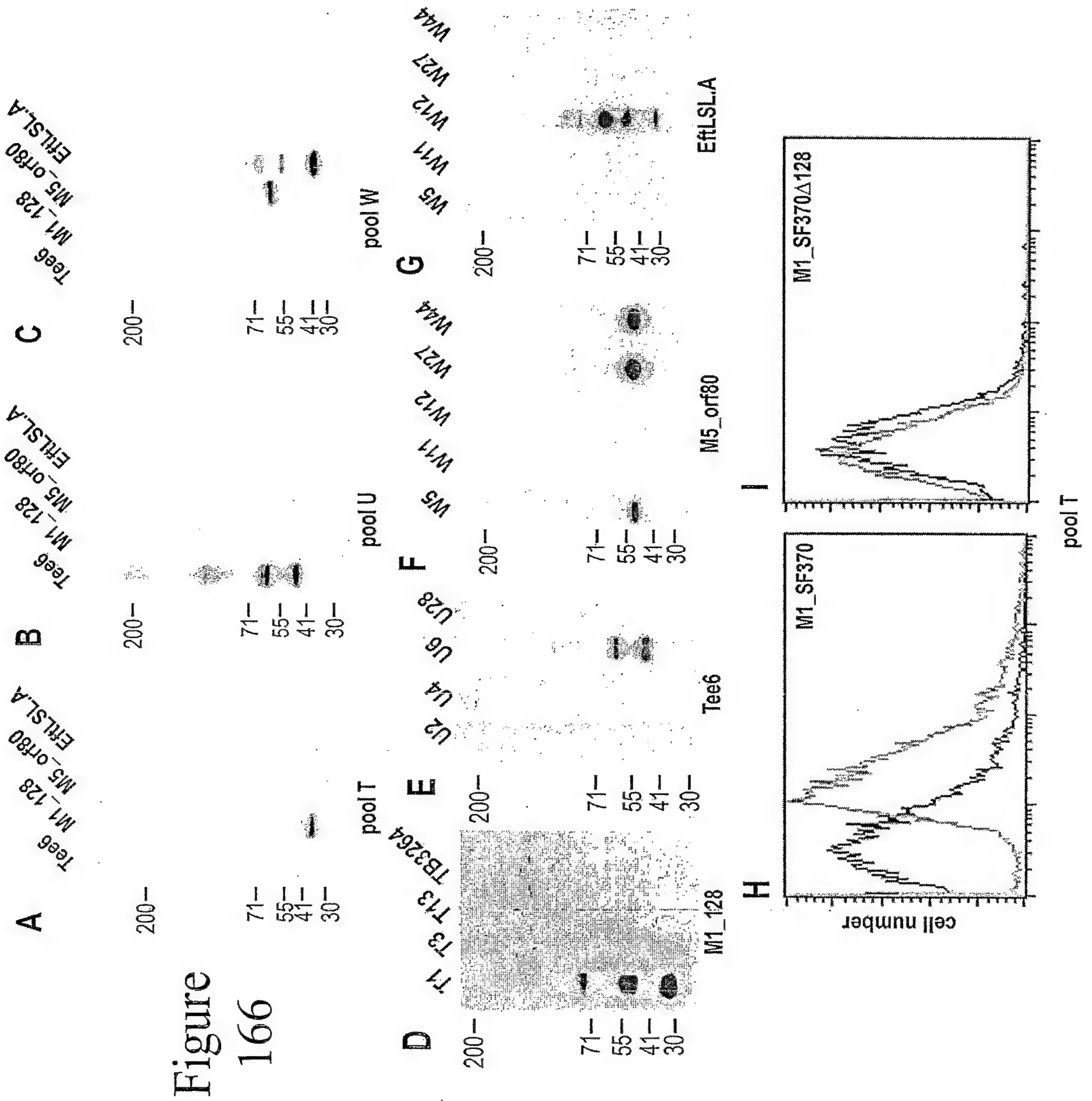




Figure 167

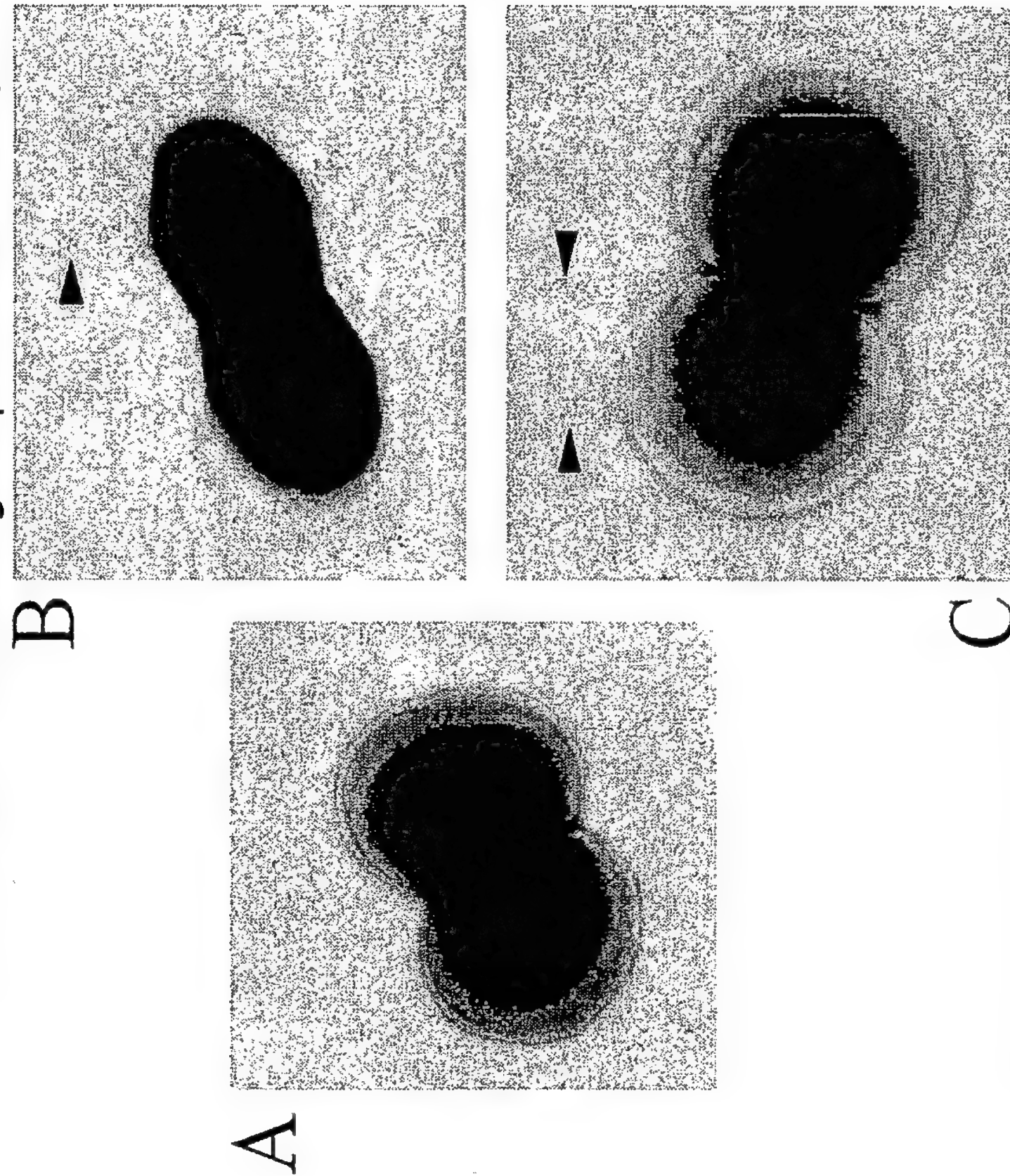
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		SrtB	SrtC1	SrtC2	MsmRL	SipA2		
2724	6	+	-	-	-	-	1	
2894	6	+	-	-	-	-	1	
3650	6	+	-	-	-	-	1	
5529	6	+	-	-	-	-	1	
Dsm2071	23	+	-	-	-	-	1	+
SF370	1	+	+	-	-	-	2	literature
2580	1	+	+	-	-	-	2	
2913	1	+	+	-	-	-	2	
3280	1	+	+	-	-	-	2	
3348	1	+	+	-	-	-	2	
2719	?	+	+	-	-	-	2	
2721	3	-	-	+	+	+	3	
3040	3	-	-	+	+	+	3	
3135	3	-	-	+	+	+	3	
3776	44 ?	-	-	+	+	+	3	+
4959	77	-	-	+	+	+	3	+
4088	Clinical isolate	-	-	+	+	+	3	
2728	12	+	-	+	+	+	4	
2720	9	+	-	+	+	+	4	+
2727	11	+	-	+	+	+	4	+
4436	28	+	-	+	+	+	4	+
5481	44 ?	+	-	+	+	+	4	+
4538	50	+	-	+	+	+	4	+
3789	78	+	-	+	+	+	4	+
4883	5	+	+	+	+	+	4	
5476	89	+	-	+	+	+	4	
5495	?	+	-	+	+	+	4	
2722	4	-	-	-	-	-	?	
2723	5?	-	-	-	-	-	?	
2725	8	-	-	+	-	-	?	
2726	2	-	-	-	-	-	?	
2634	4	-	-	-	-	-	?	
5531	75	+	+	-	-	-	?	In progress

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Figure 168

# **Immuno-electronmicroscopy**

(Immunogold Negative Staining,  
1°  $\alpha$  - 80, 2°  $\alpha$ -mouse gold particles 10nm )



*L.lactis* + AI-1

+

*L.lactis*

-

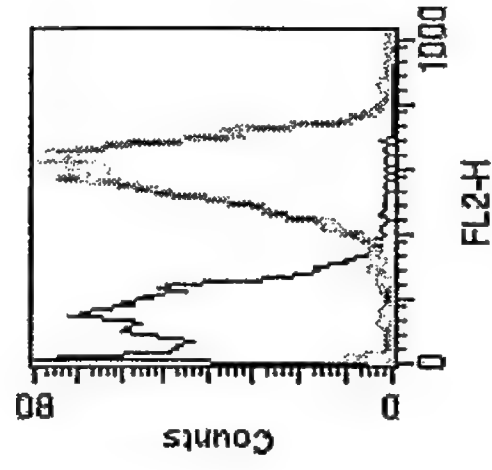


Figure 169

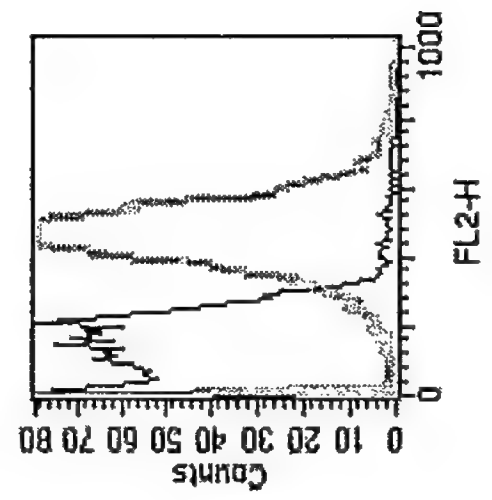
GBS JM9130013

*L. lactis* + AI-1

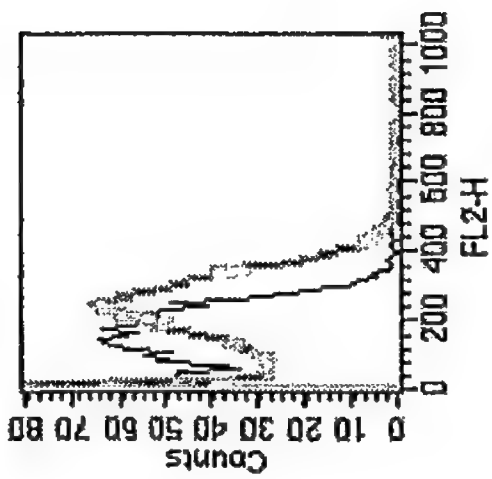
*L. lactis*



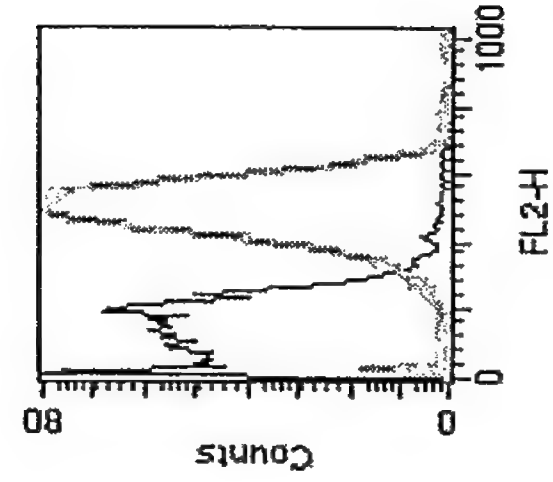
$\Delta$ Mean 461



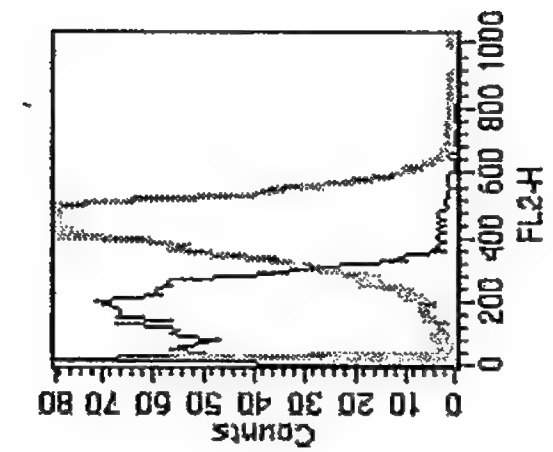
$\Delta$ Mean 298



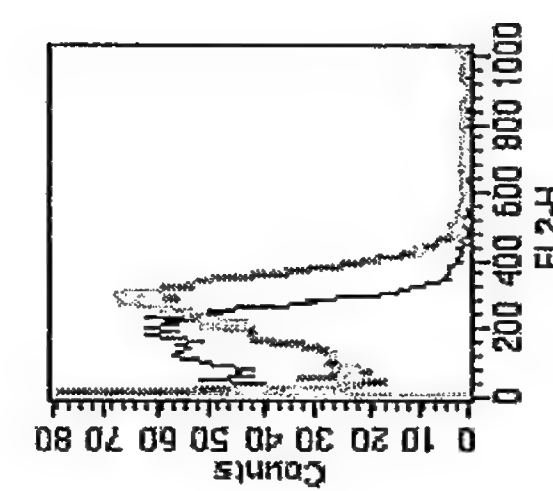
$\Delta$ Mean < 100



$\Delta$ Mean < 355



$\Delta$ Mean < 251



$\Delta$ Mean < 100

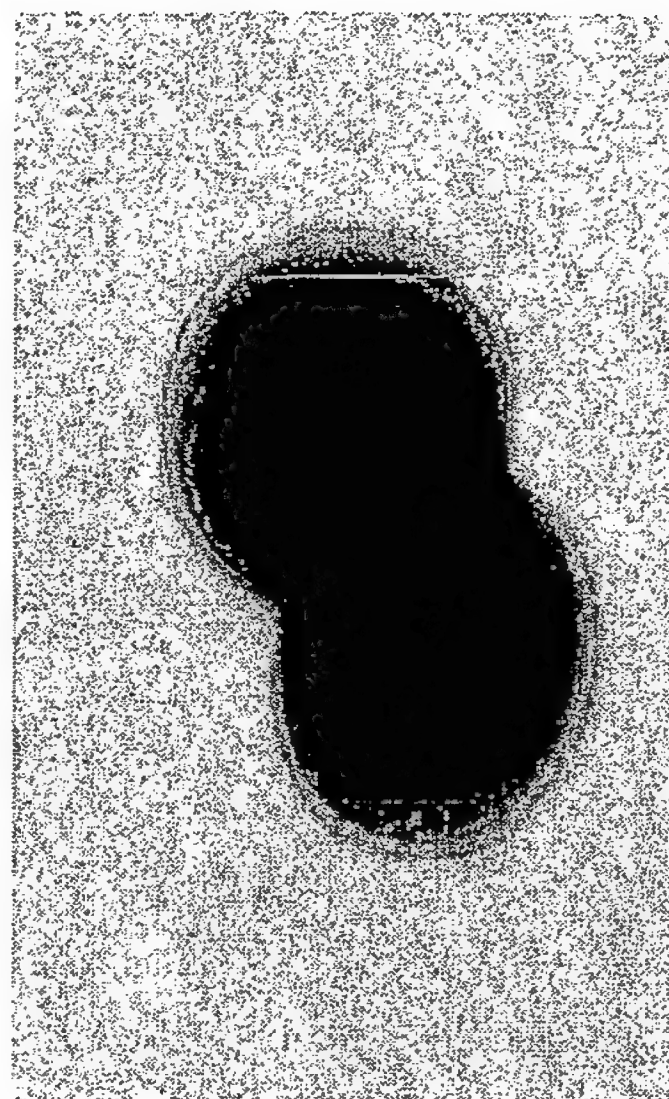
$\alpha$ -80

$\alpha$ -104

Figure 170

**Phase contrast Microscopy**      **Immuno-electronmicroscopy**  
 (Immunogold Negative Staining,  
 1°  $\alpha$ -80, 2°  $\alpha$ -mouse gold particles 10nm )

*L. lactis*



*L. lactis* + AI-1

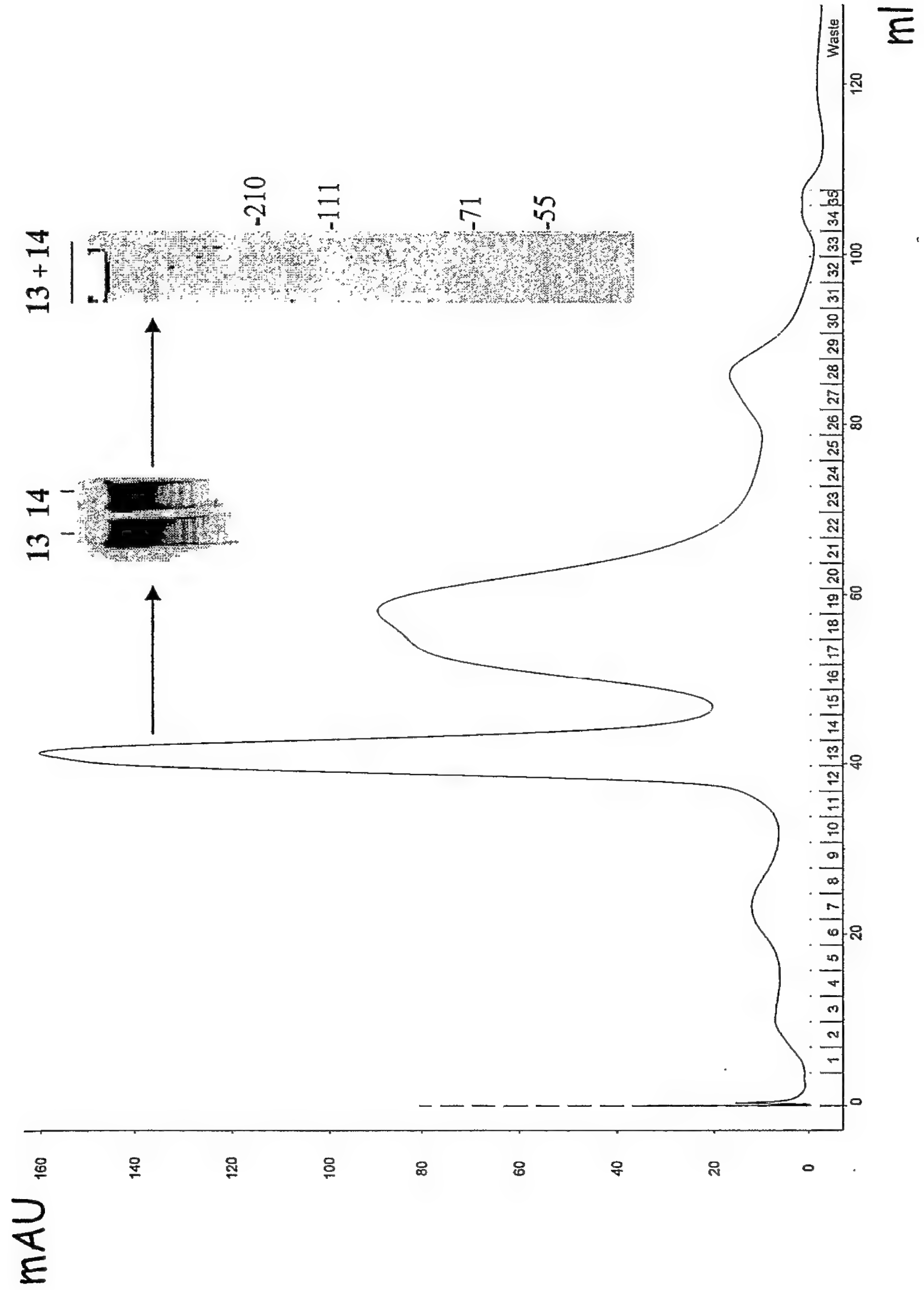




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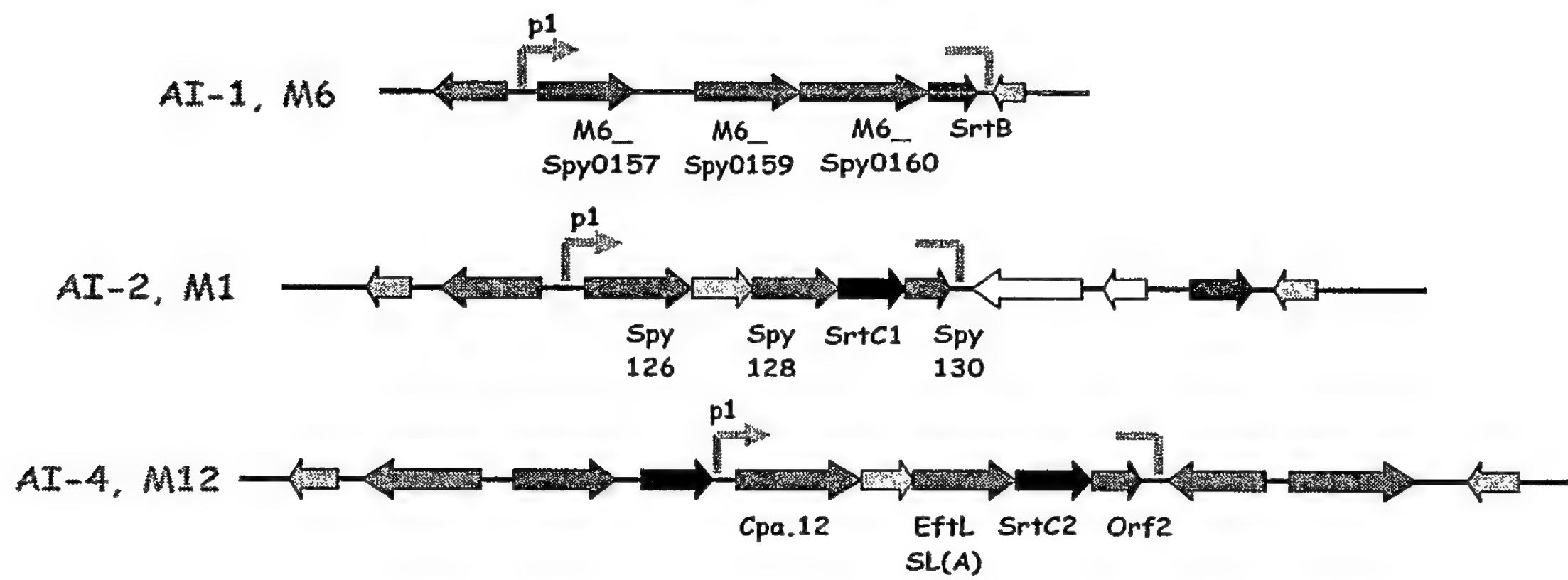
Figure 171

Gel filtration on Sepharyl HR 400



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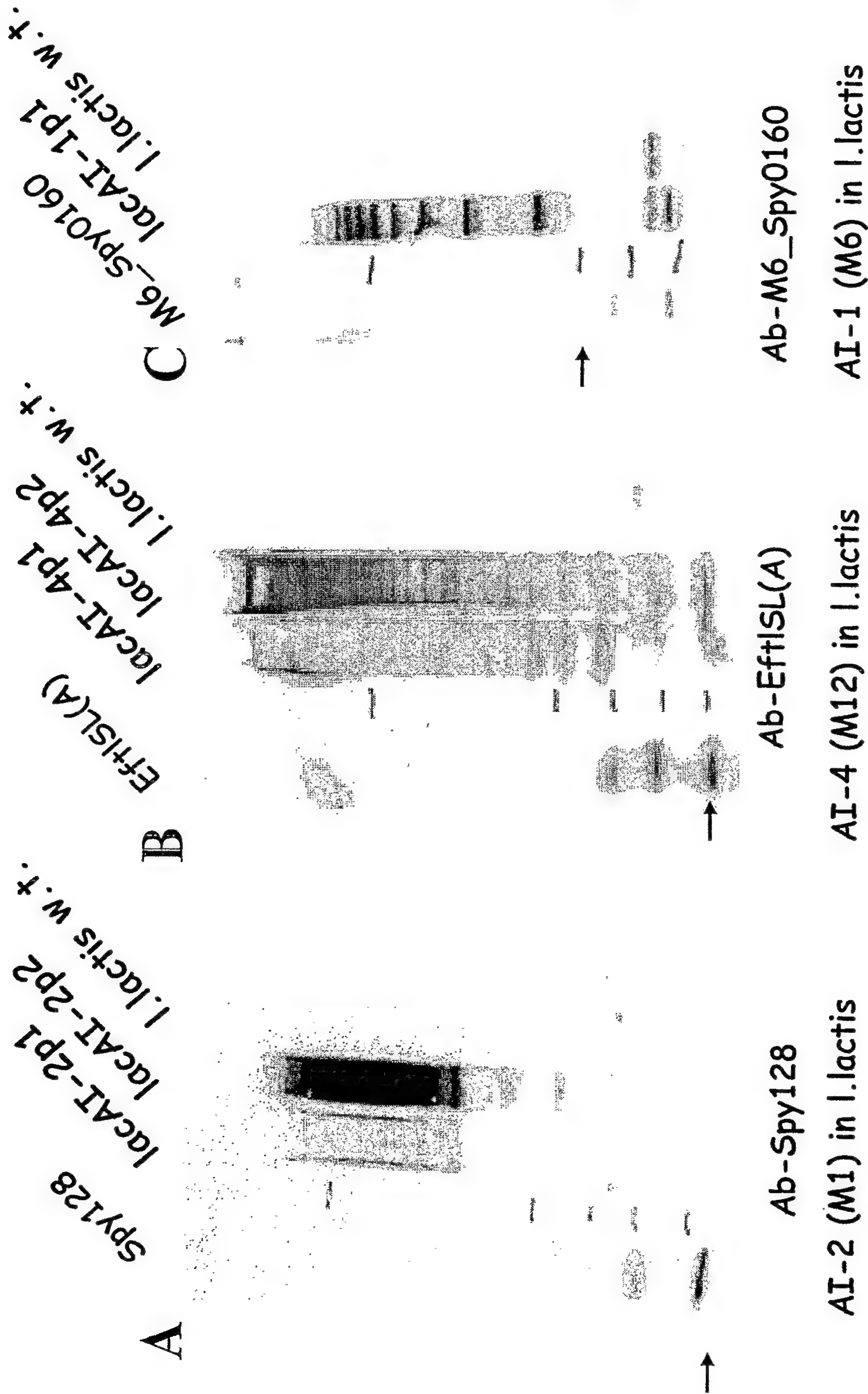
Figure 172





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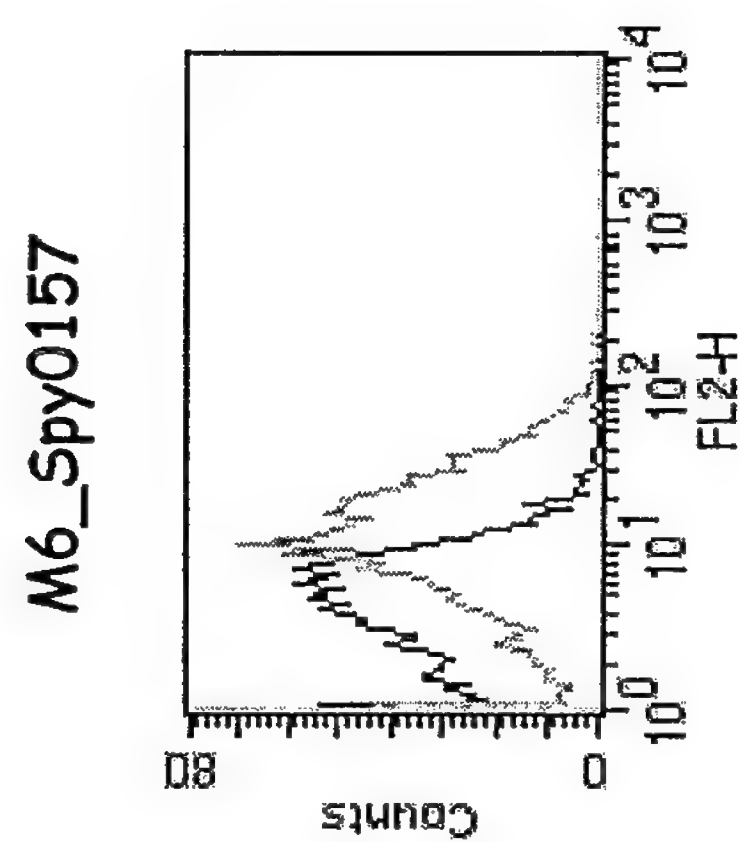
Figure 173



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Figure 174





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Figure 175

Orf2

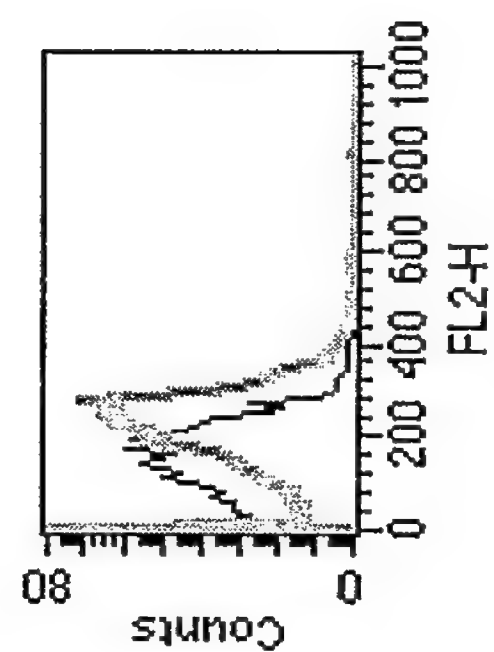
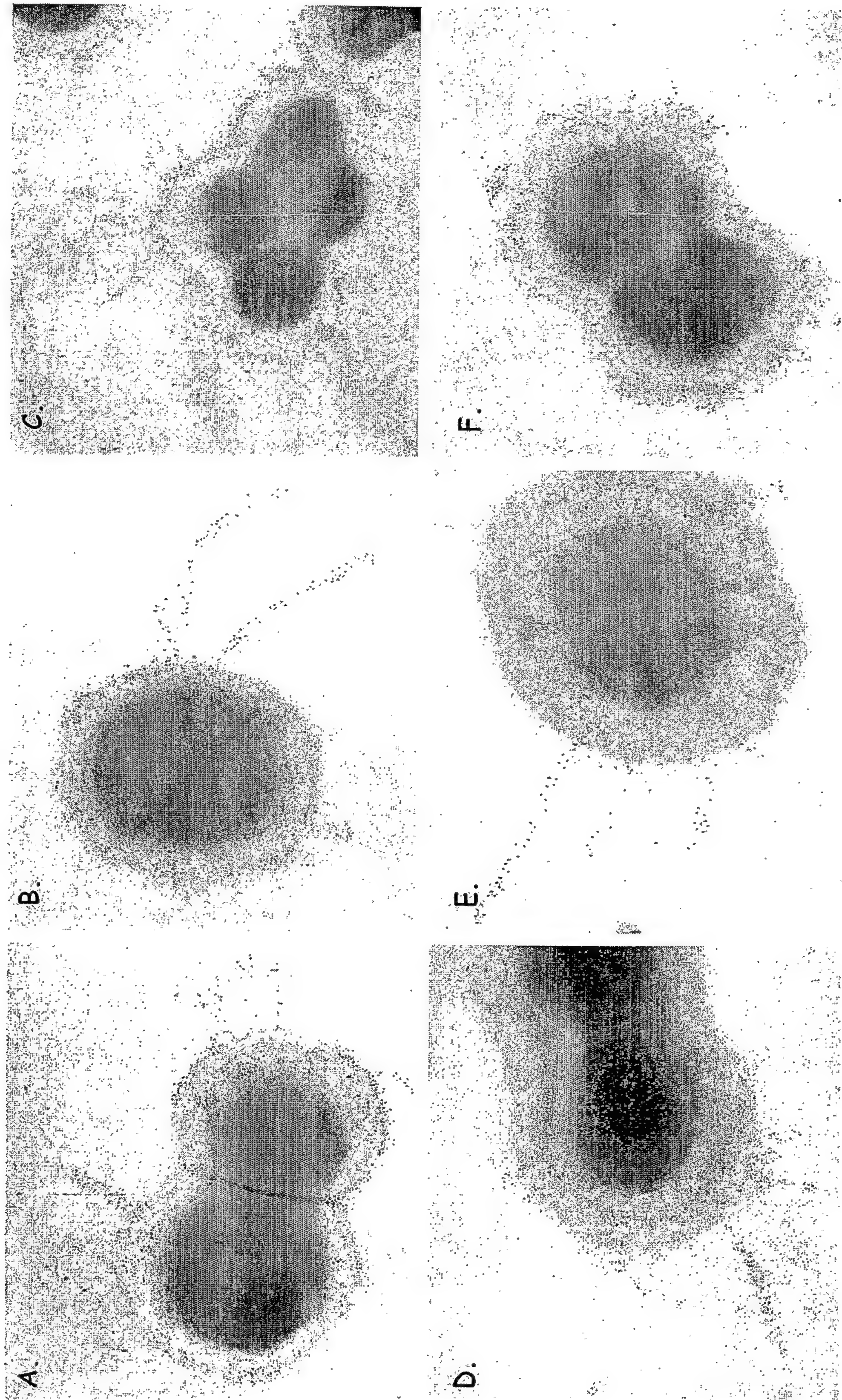


Figure 176



Immunogold labeling with antibodies against: A. B. C. D. E. M6\_Spy0160; F. M6\_Spy0159

Figure 177

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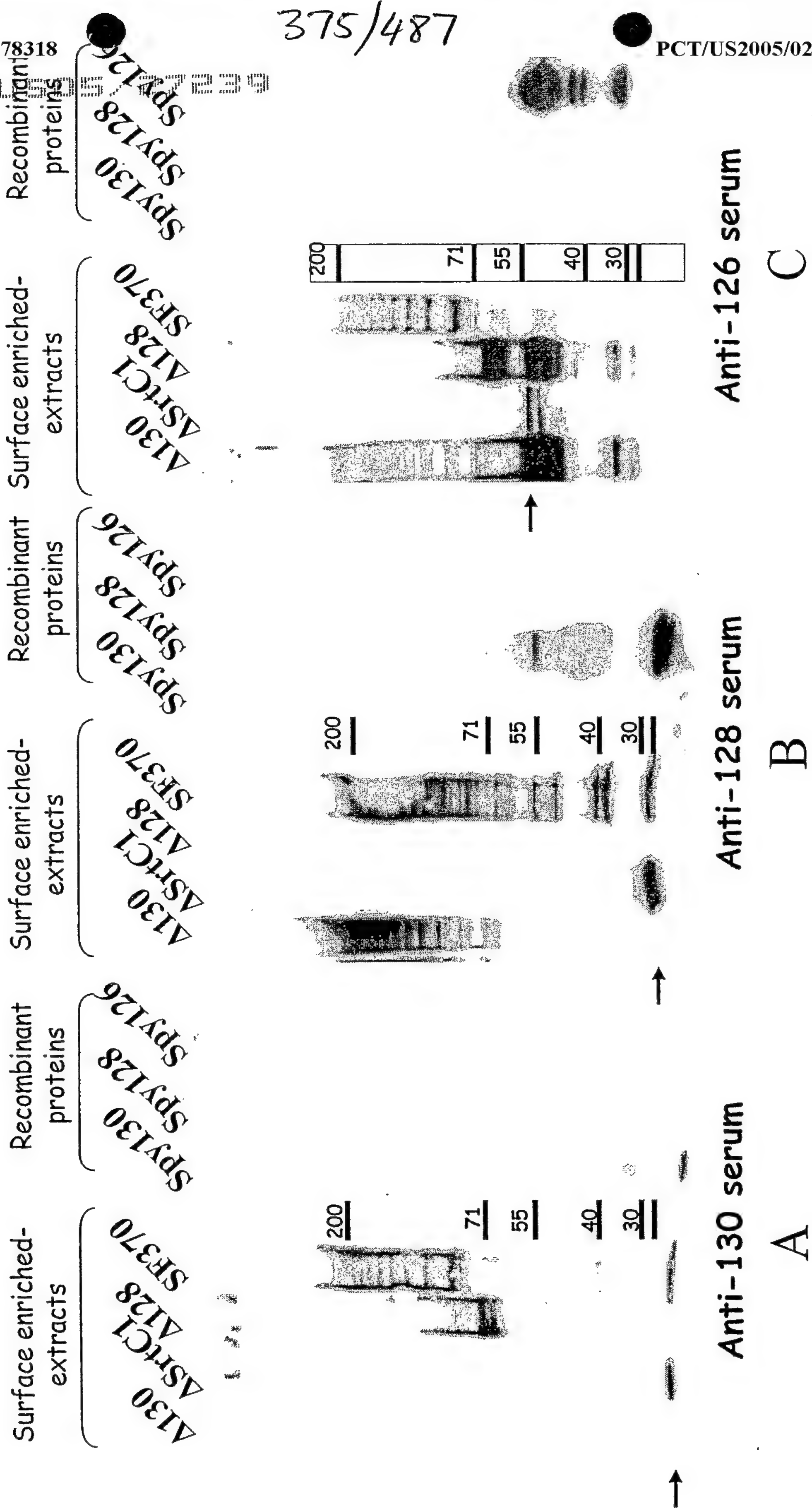
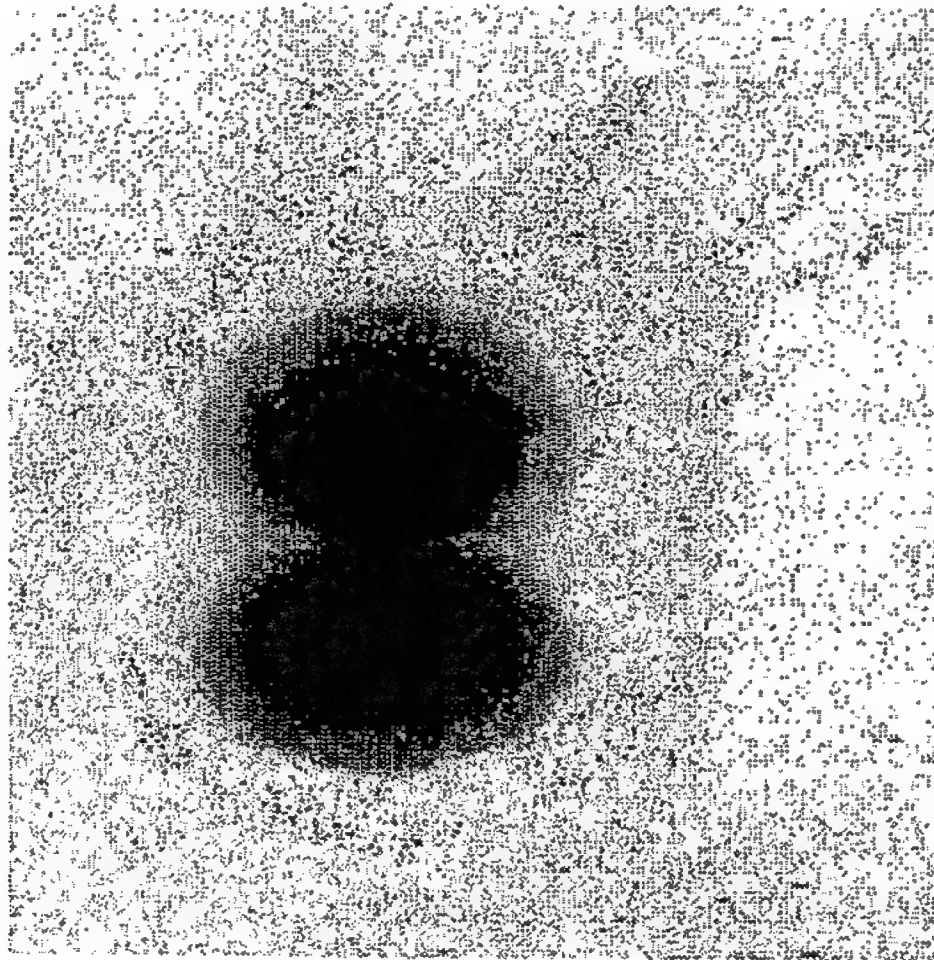




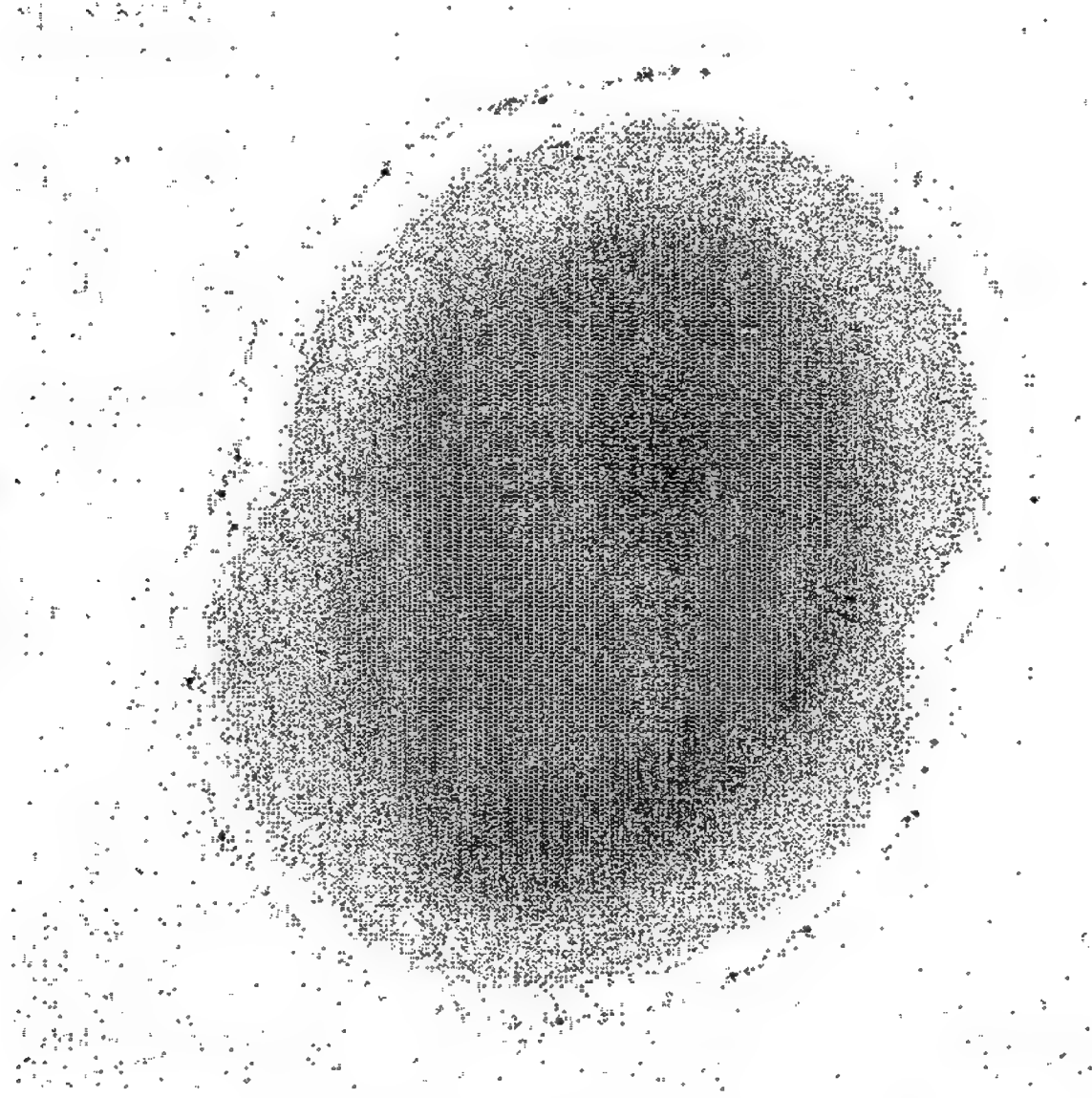
Figure 178

A

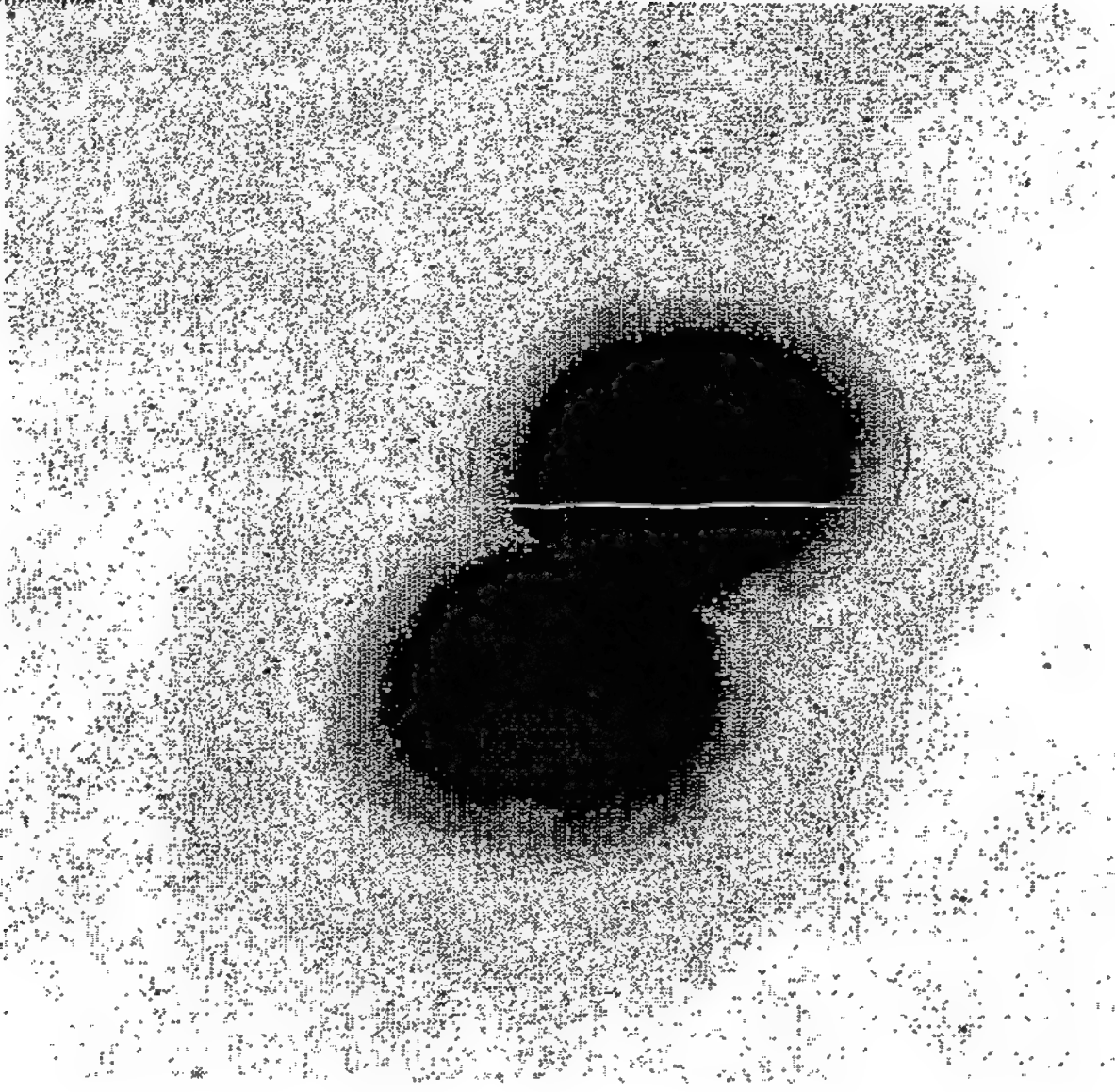
SF370 w.t.



B

 $\Delta 128$ 

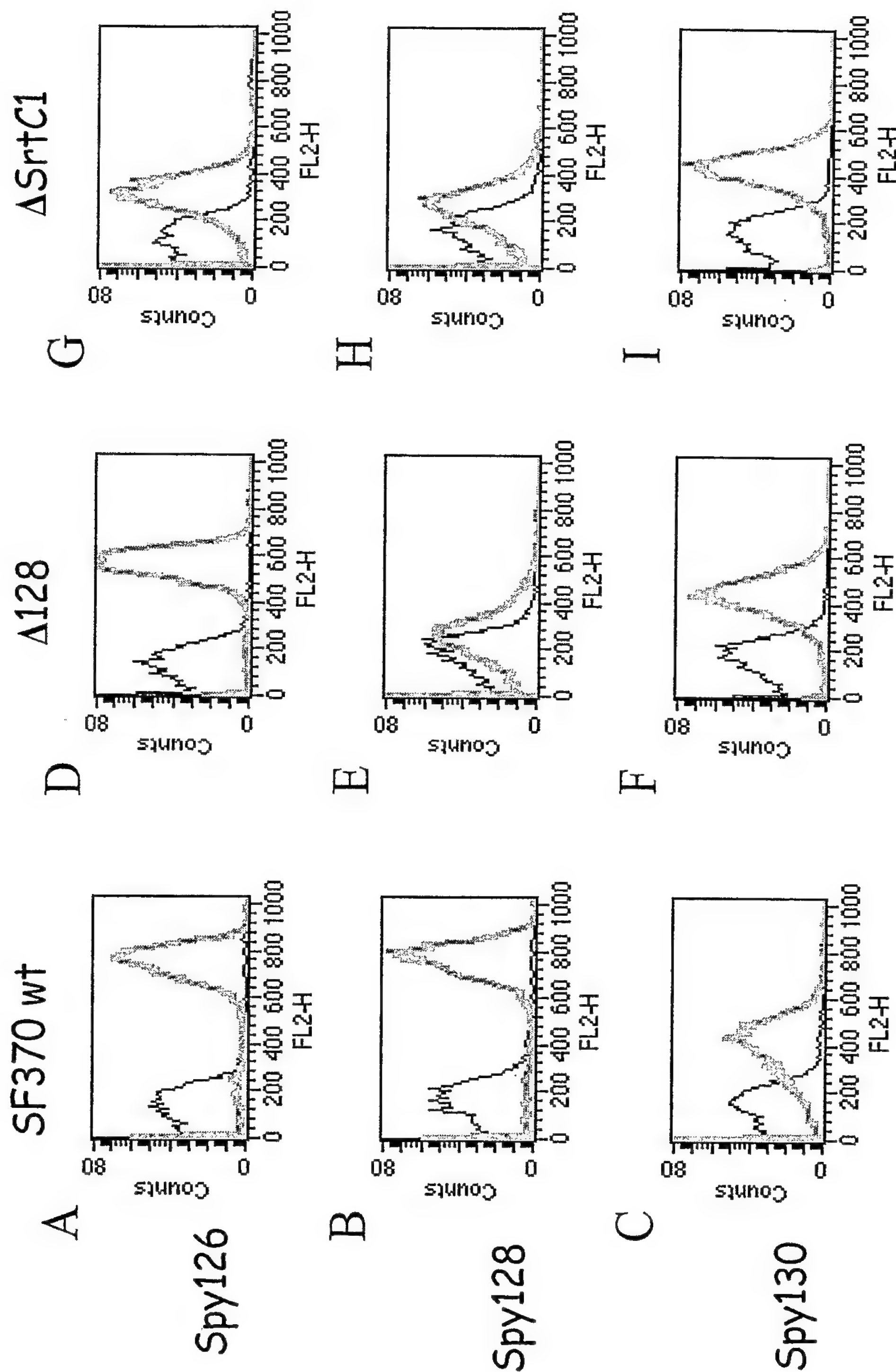
C

 $\Delta \text{SrtC1}$ 

### Immuno-gold labeling with sera against Spy128

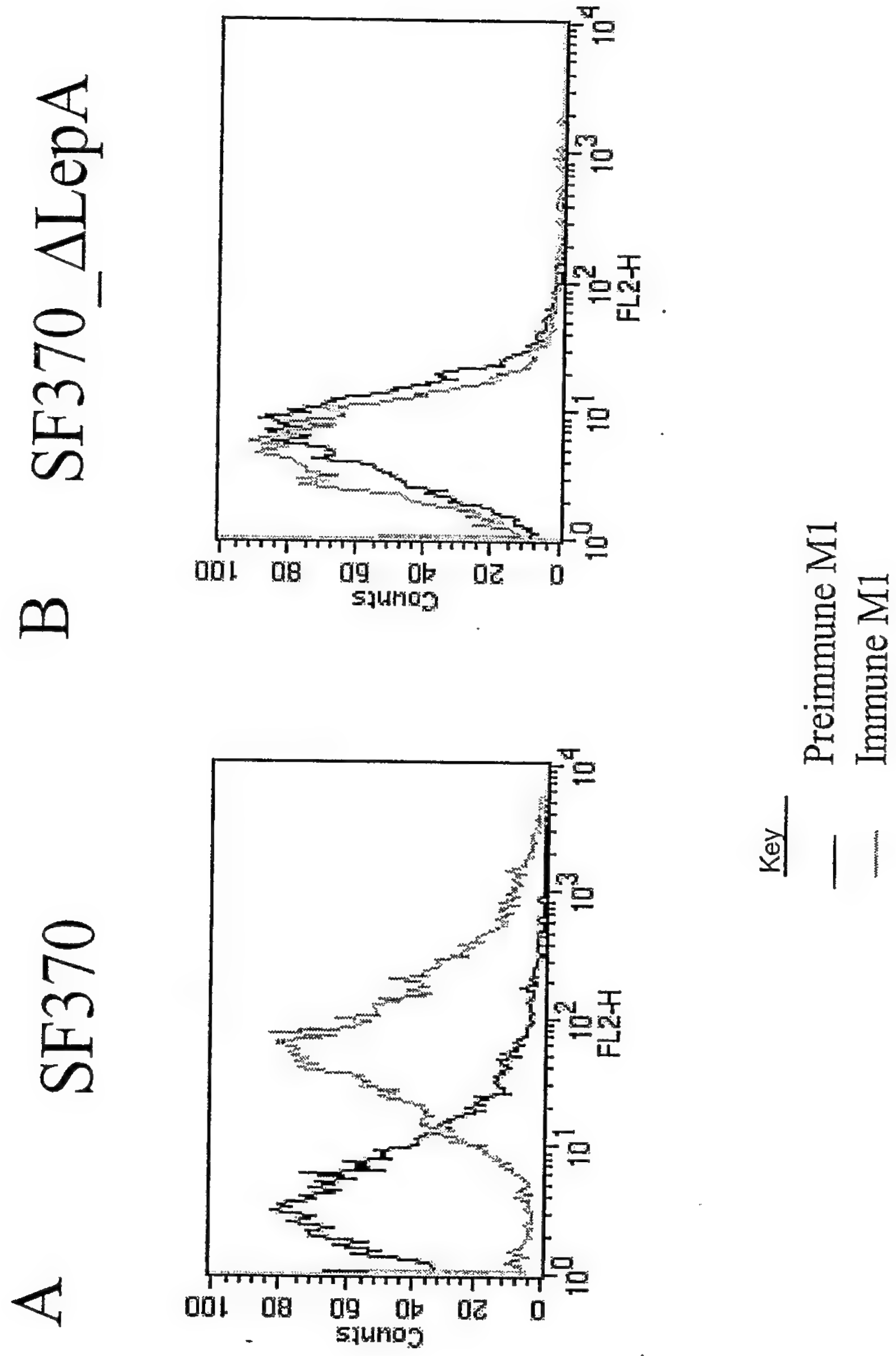
Comparison of wild type and mutant strain by Immunoelectron Microscopy show that Spy128- or SrtC1-lacking bacteria are not able to assemble pili. SrtC1, therefore, is absolutely required for pilus assembly but not for surface anchoring.

Figure 179



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Figure 180





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Figure 181

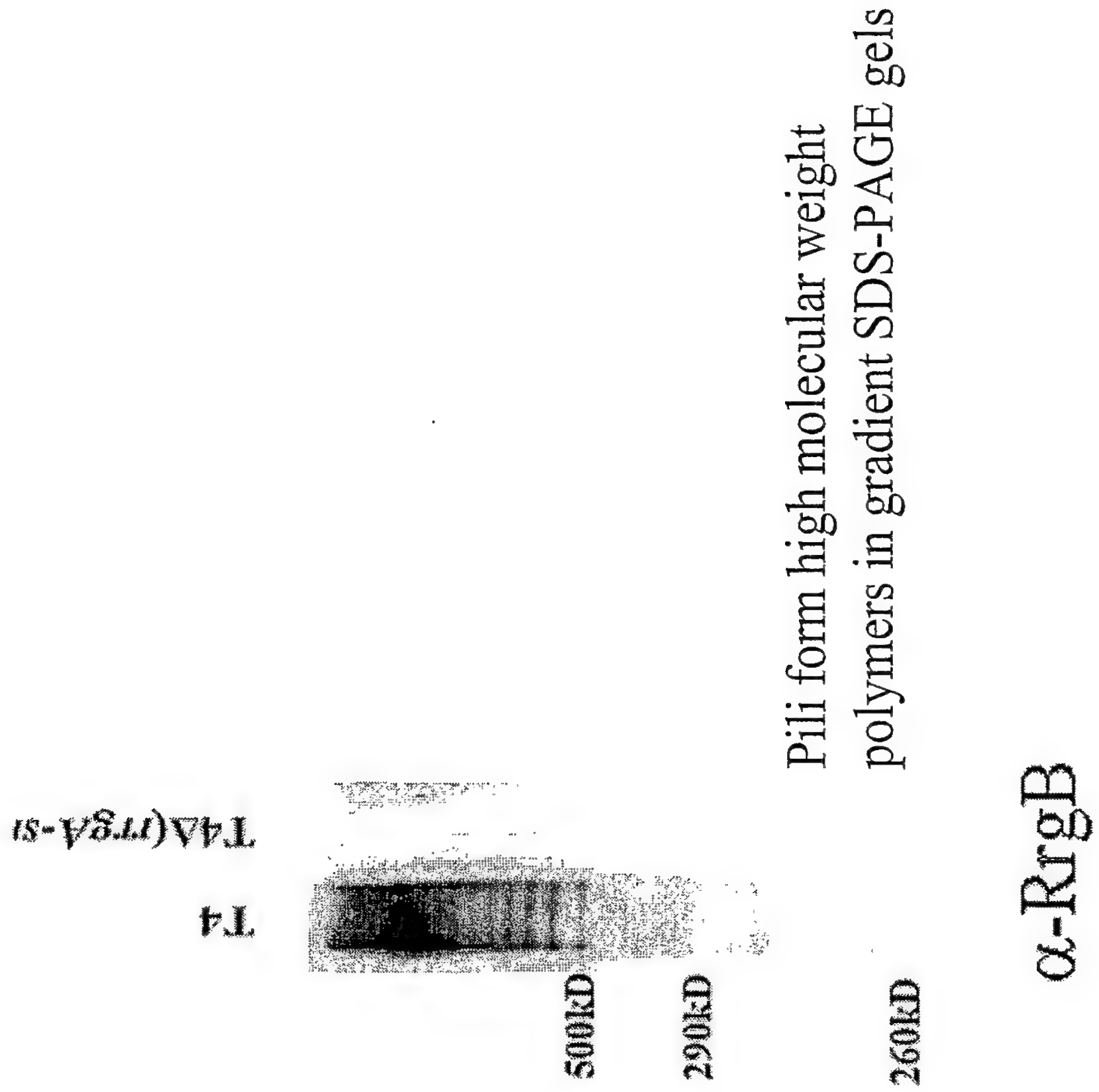
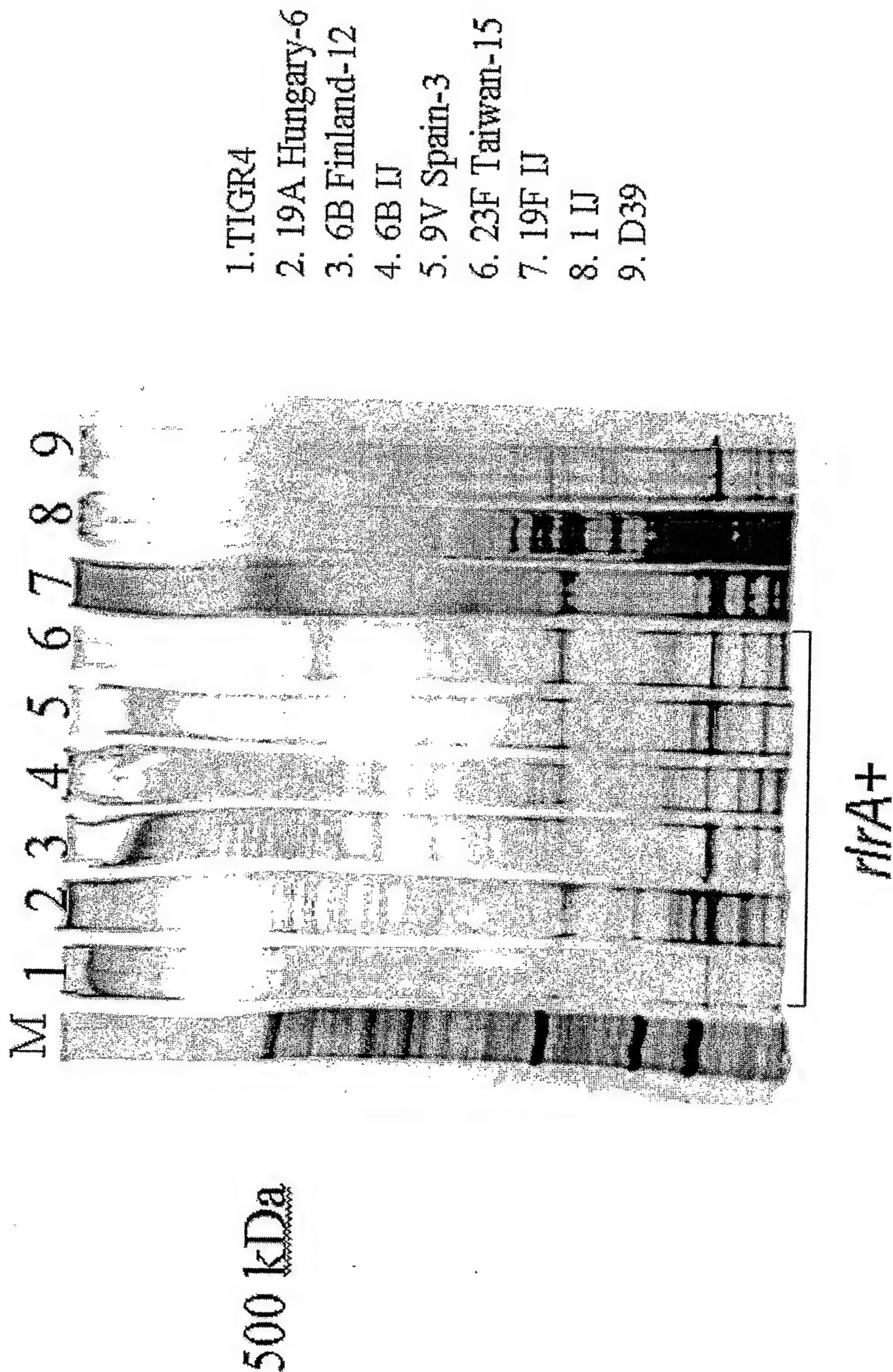
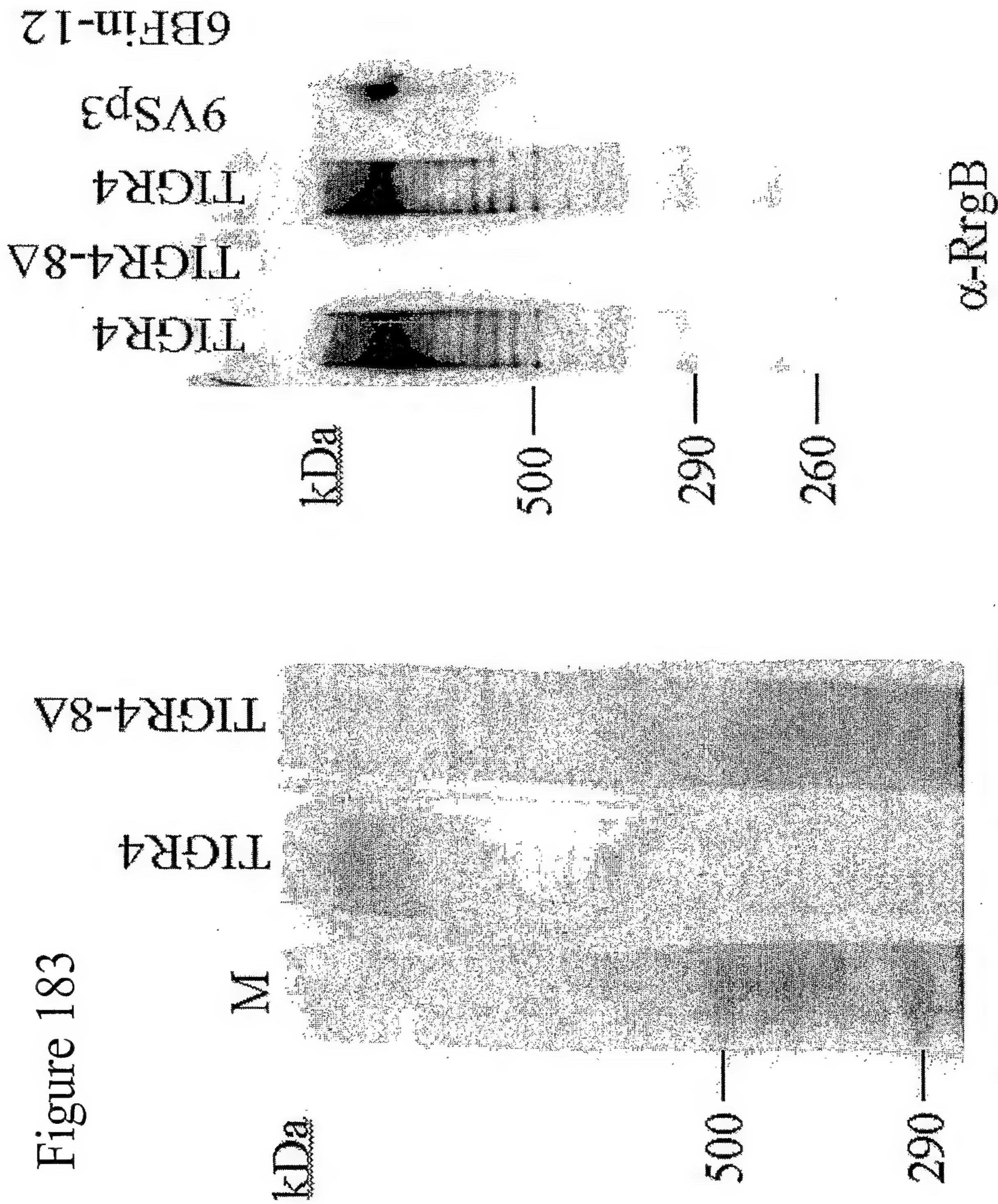


Figure 182





Silver stained gel 3-8%

$\alpha$ -RrgB

Anti-RrgB TIGR4 recognized the 9v pili

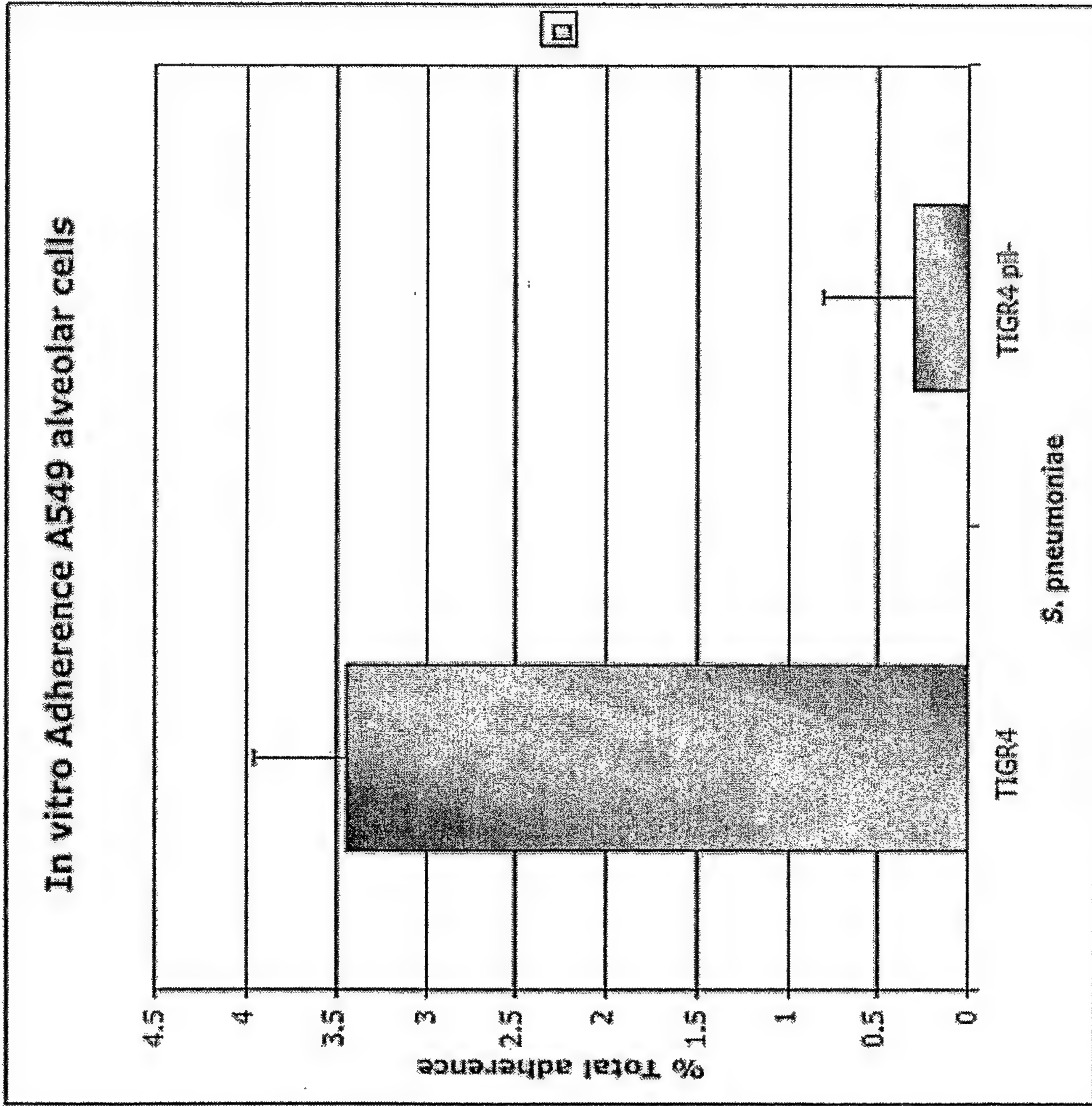
Figure 183



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Figure 184



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Figure 185



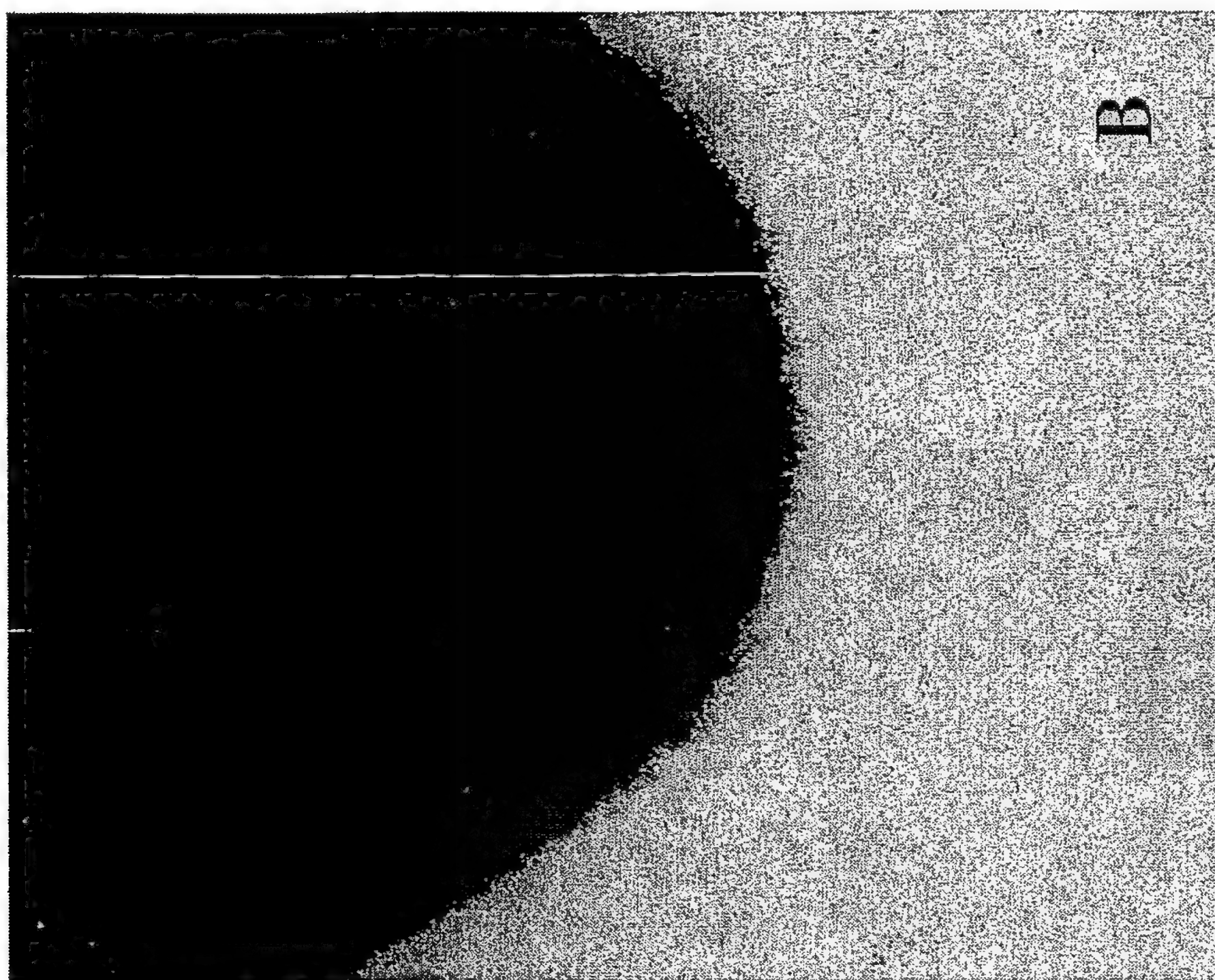


Figure 186



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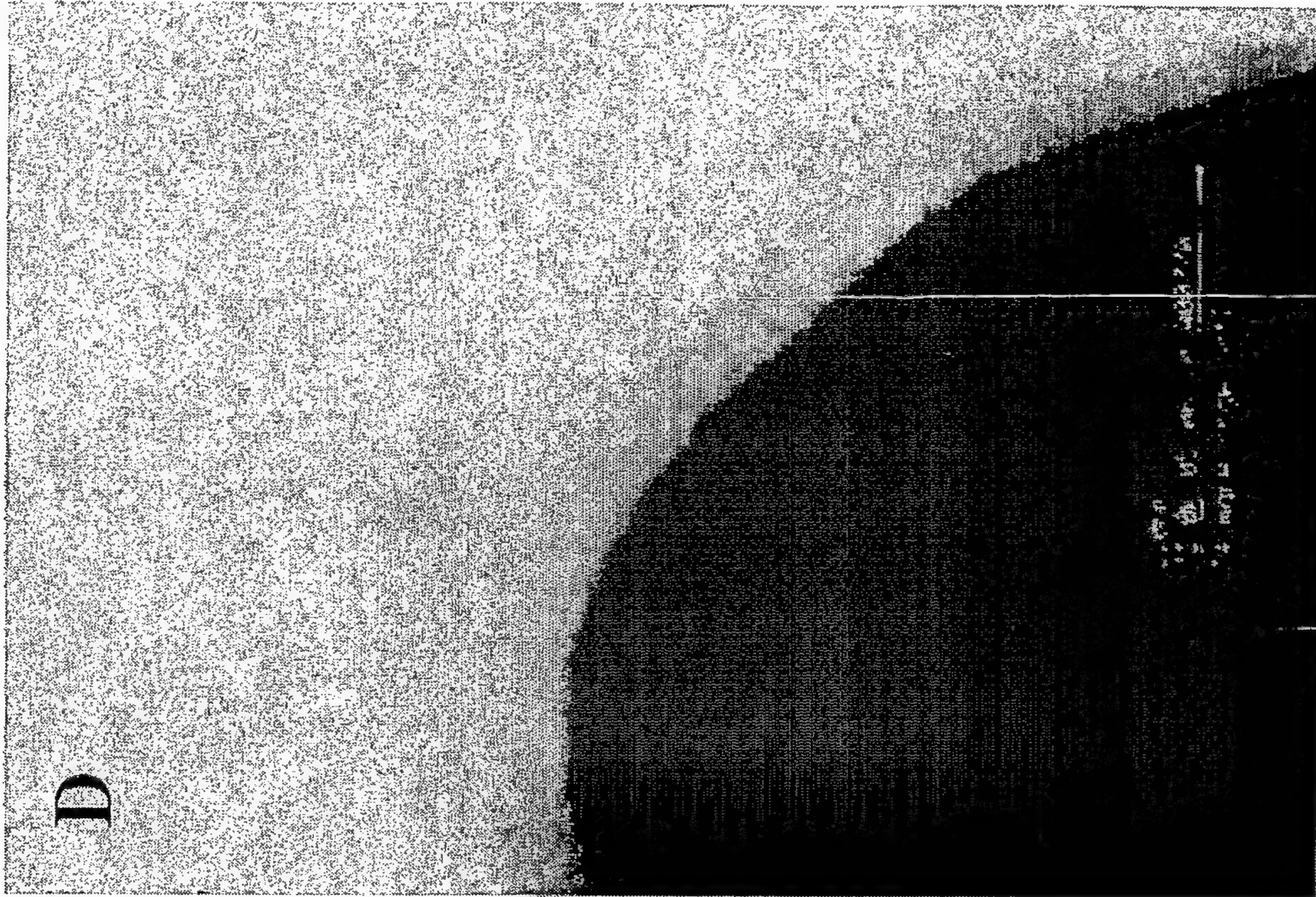


Figure 188

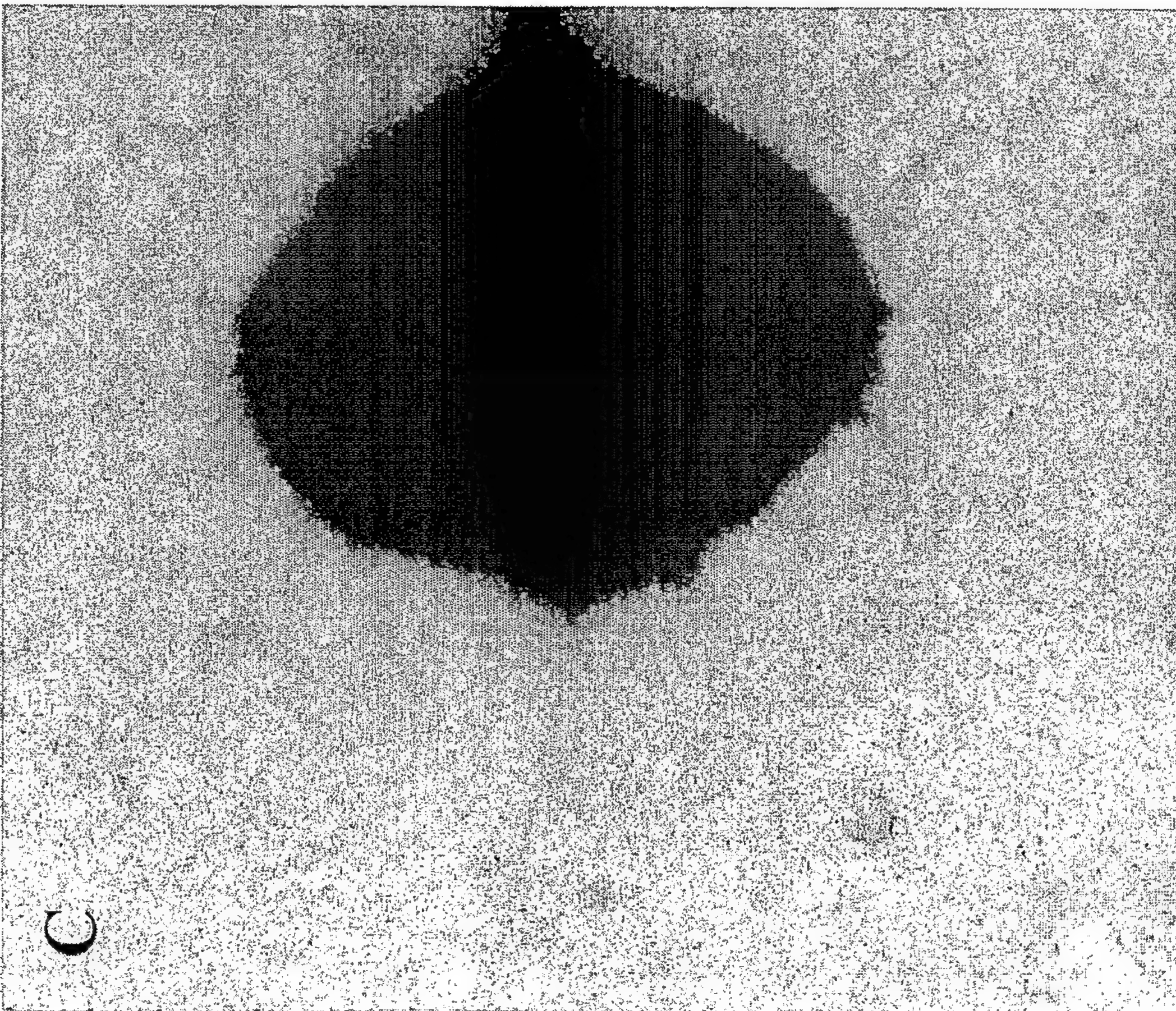


Figure 187



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Figure 189

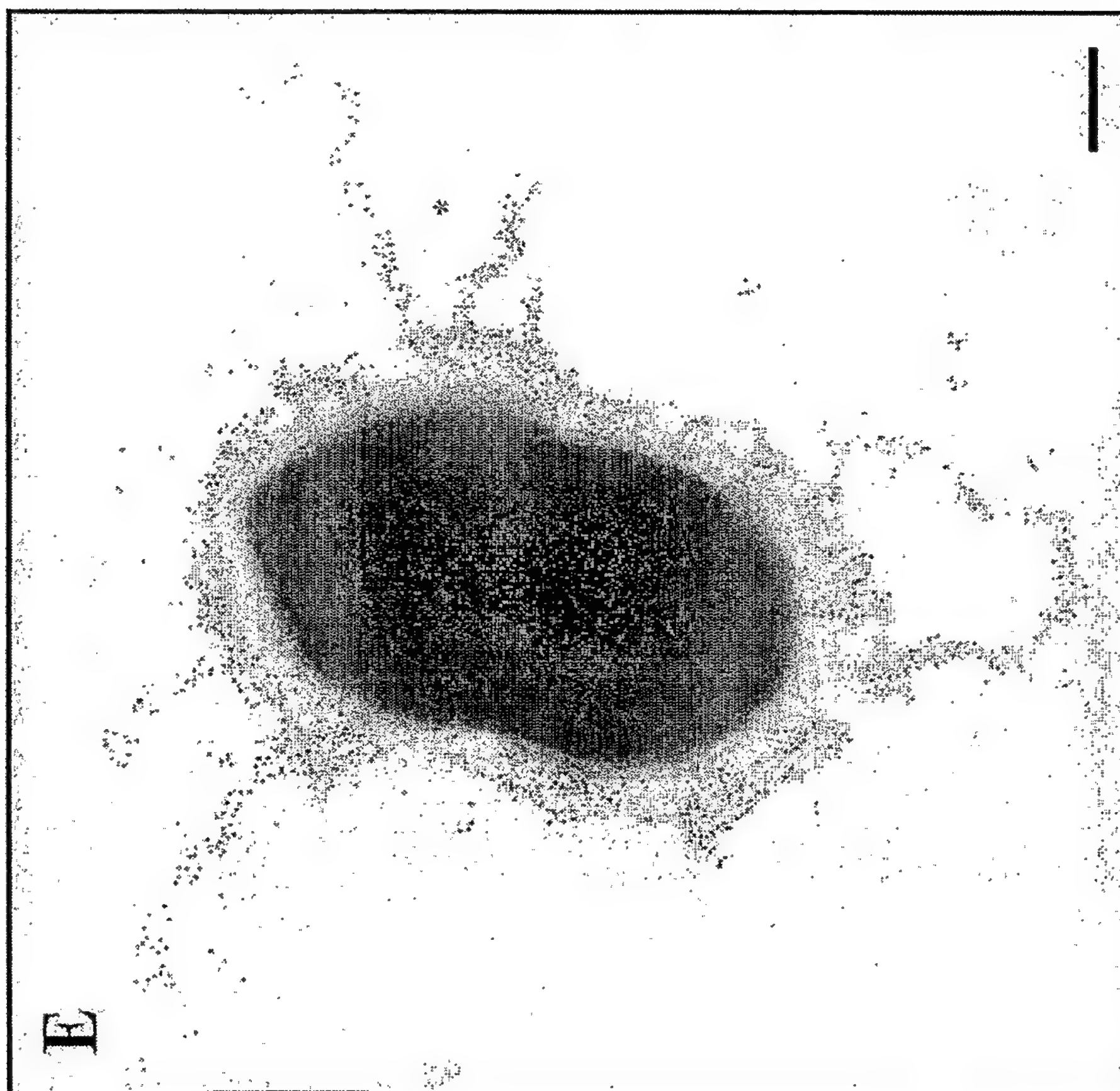


Figure 190

*S. pneumoniae* pili proteins: sp0462 (Rrg.A)

Expression and purification:

- pET 21b+-*rrg.A-6*

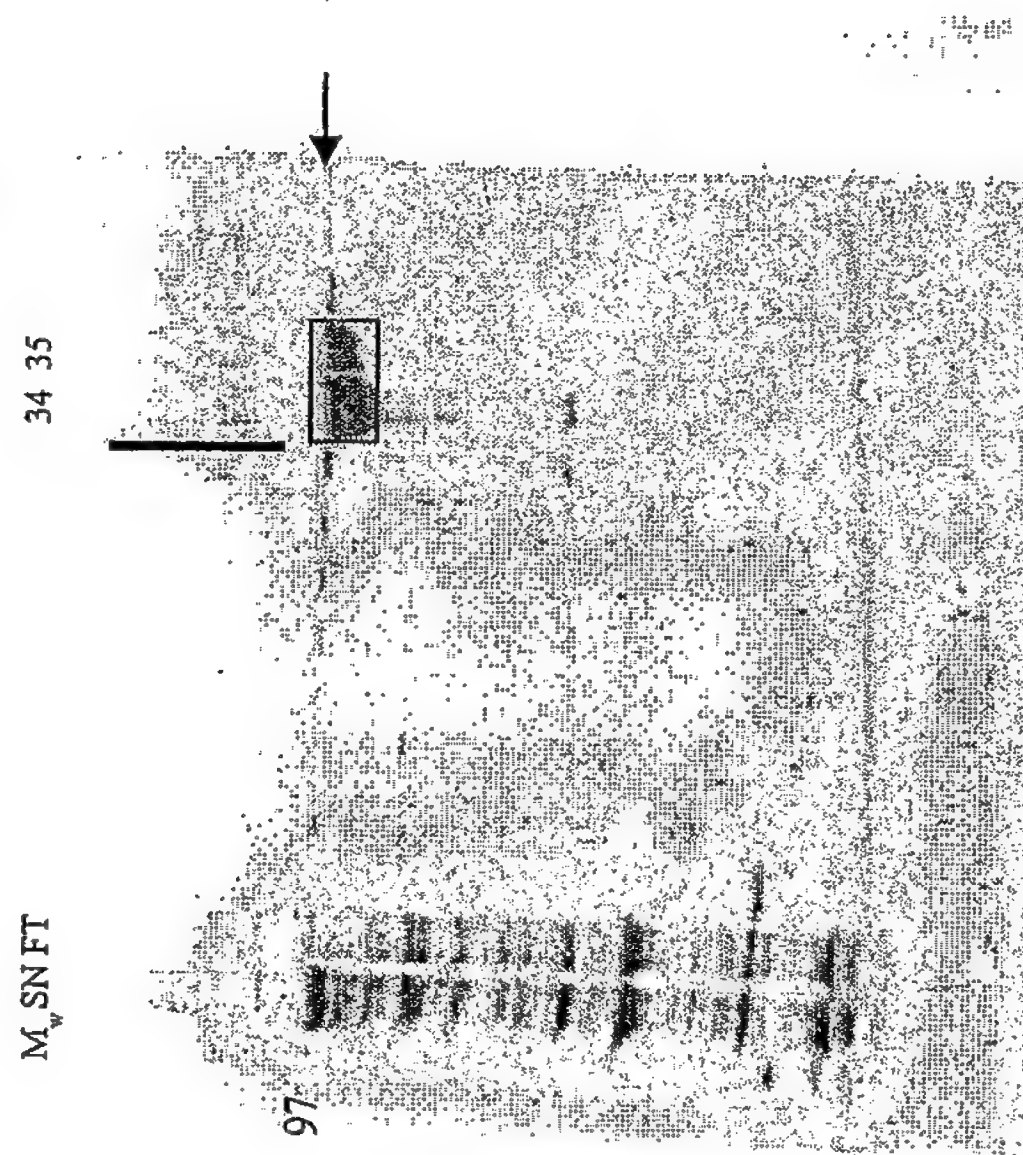
- purified in soluble form (stored at  $-80^{\circ}\text{C}$ ; in  $\text{NaCl}_{\text{physiol.}}$ )



Results:

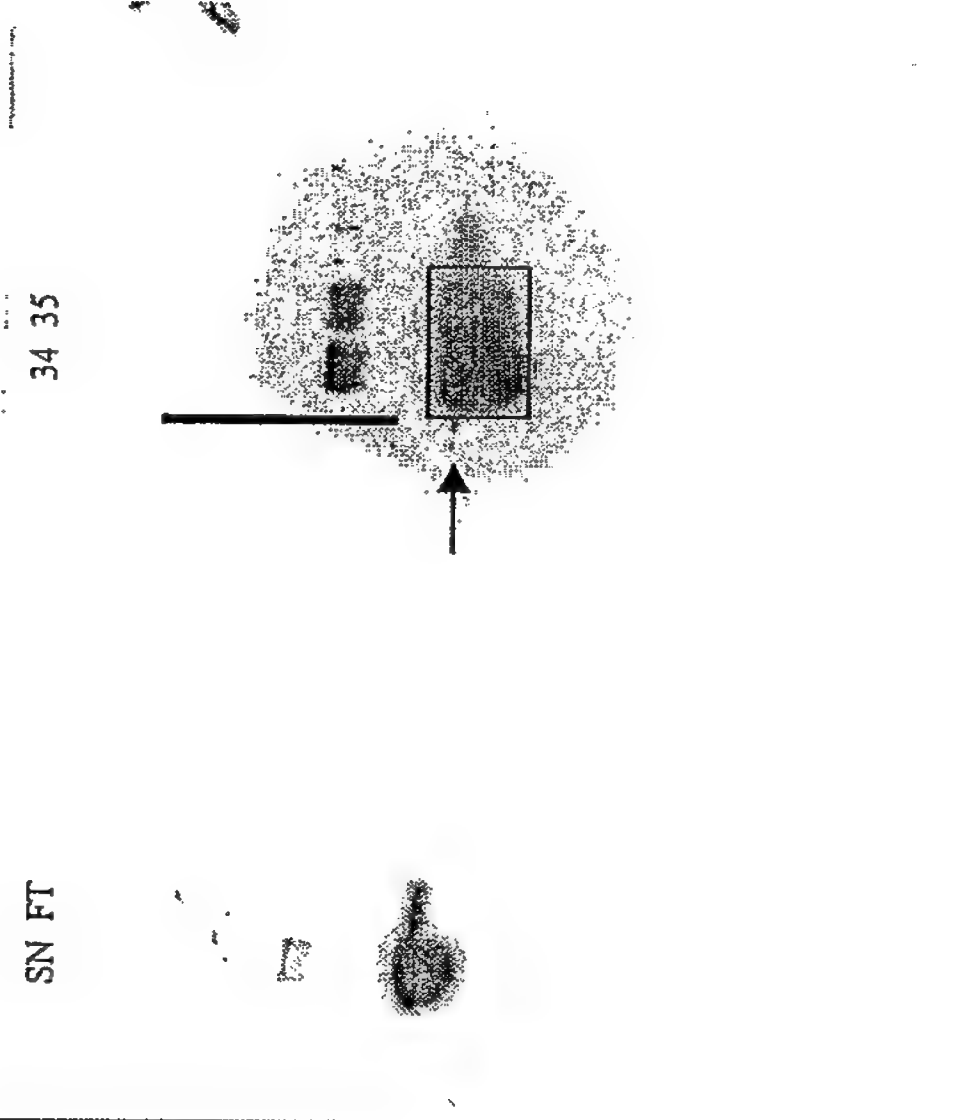
- protein conc.: 1,1 mg/ml

A



SDS-page

B



Western blot (anti-HIS)



# *S. pneumoniae* pili proteins – antibody production (mice)

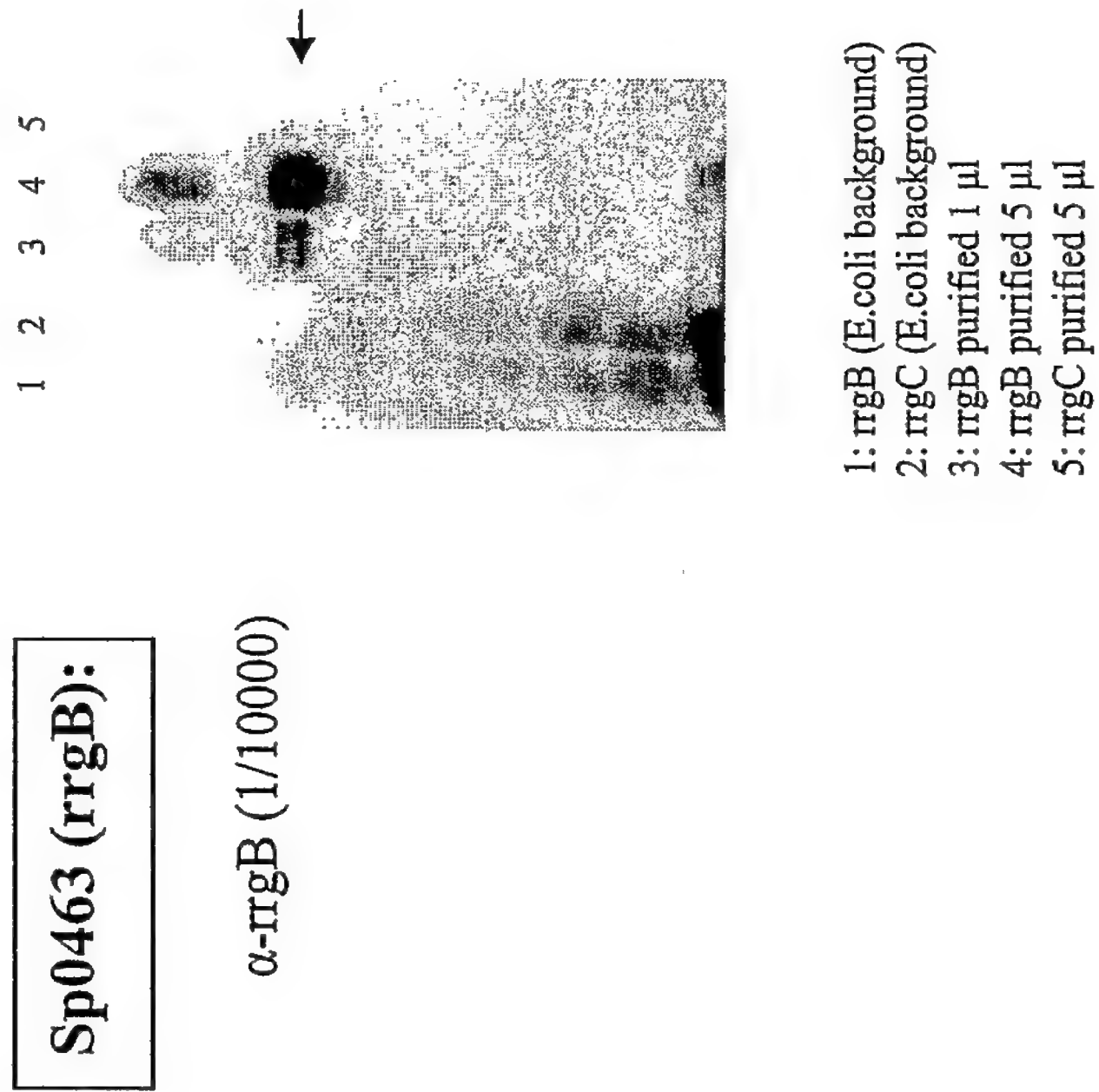


Figure 191

*S. pneumoniae* pili proteins – antibody production (mice)

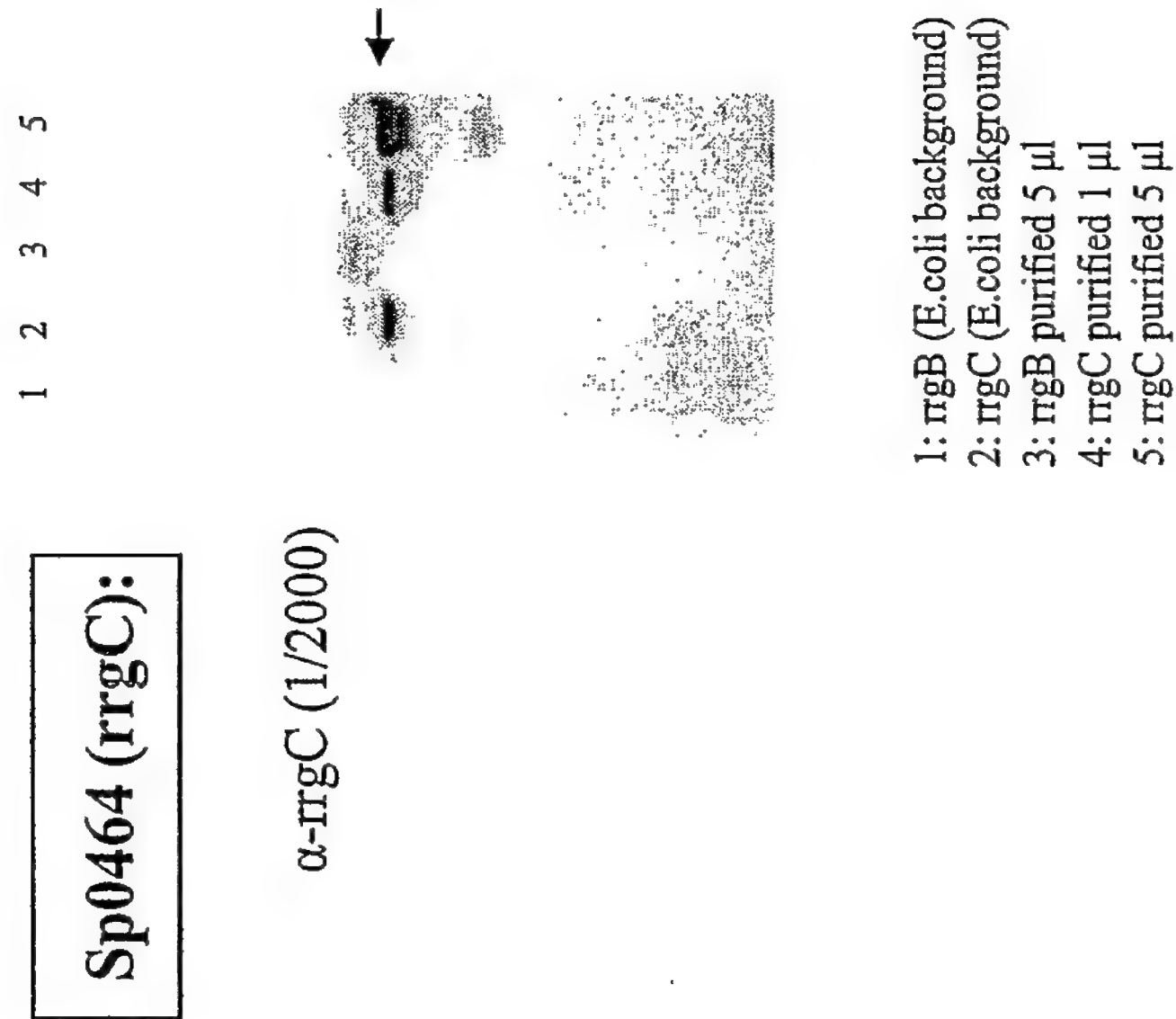
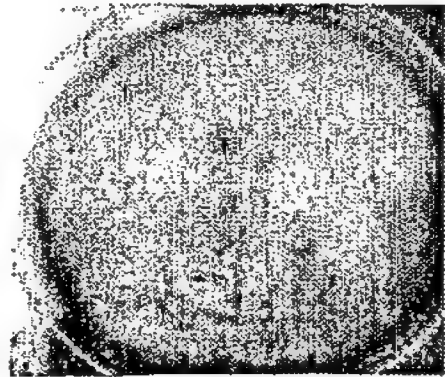


Figure 192

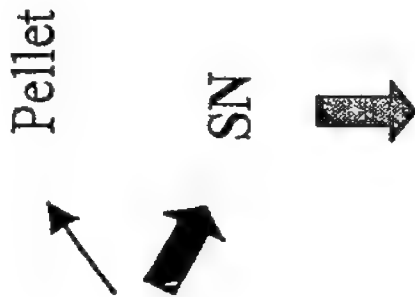
*S. pneumoniae* TIGR4 pilus purification + digestion



*S. pneumoniae* TIGR4  
Blood plates  
ON/37°C/13h

- Resuspension in PBS/washing
- Resuspension in PPB (4-6 plates/ml)  
(20% sucrose, 10mM MgCl<sub>2</sub>,  
50mM NaPPi pH6.3)

- Digestion with Mutanolysin  
(N-Acetyl Muramidase)  
37°C, ~10 h



Sucrose Density  
gradient centrifugation

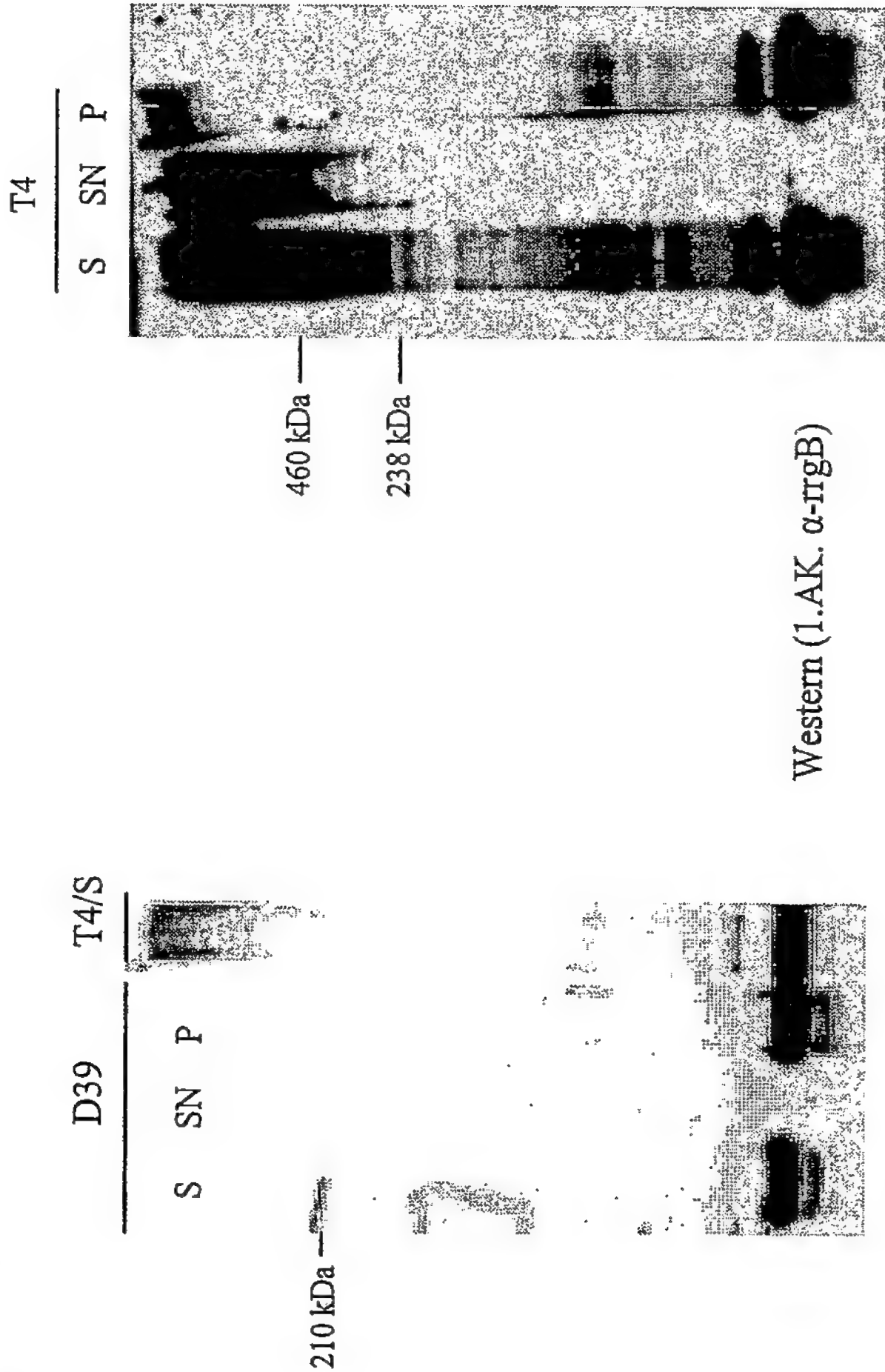


Figure 193



# *S. pneumoniae* TIGR4 pilus purification II - Sucrose density gradient centrifugation

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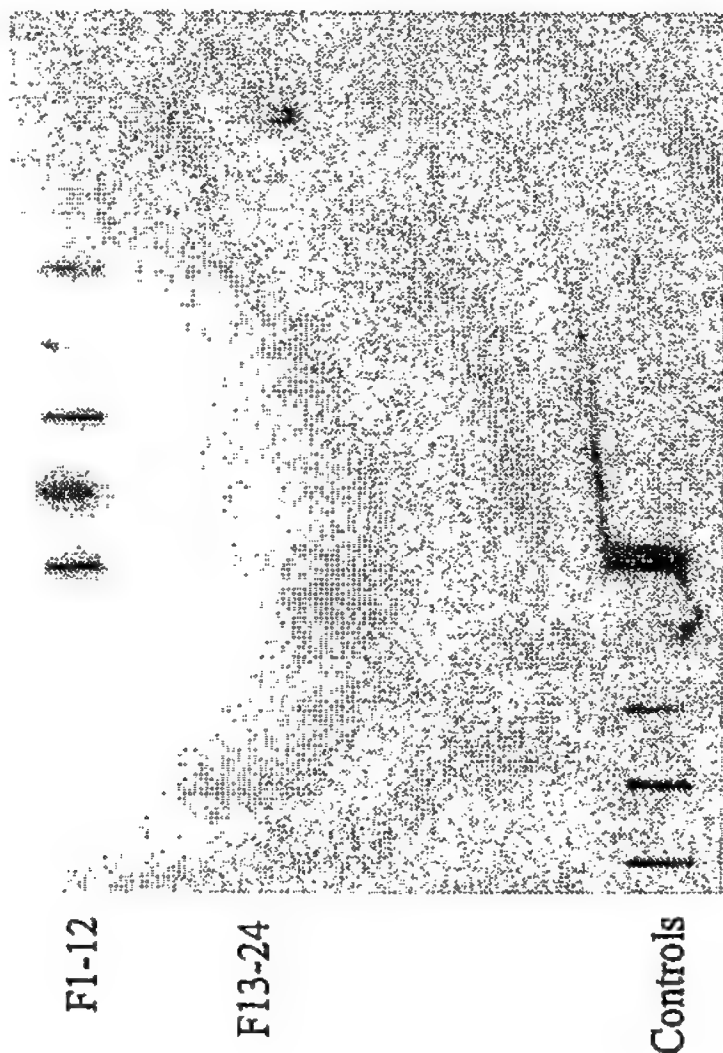
950µl SN  
25-56% linear sucrose gradient  
SW40; 38000, 4°C, 16h



24 x 500 µl fractions  
(Gradient master)

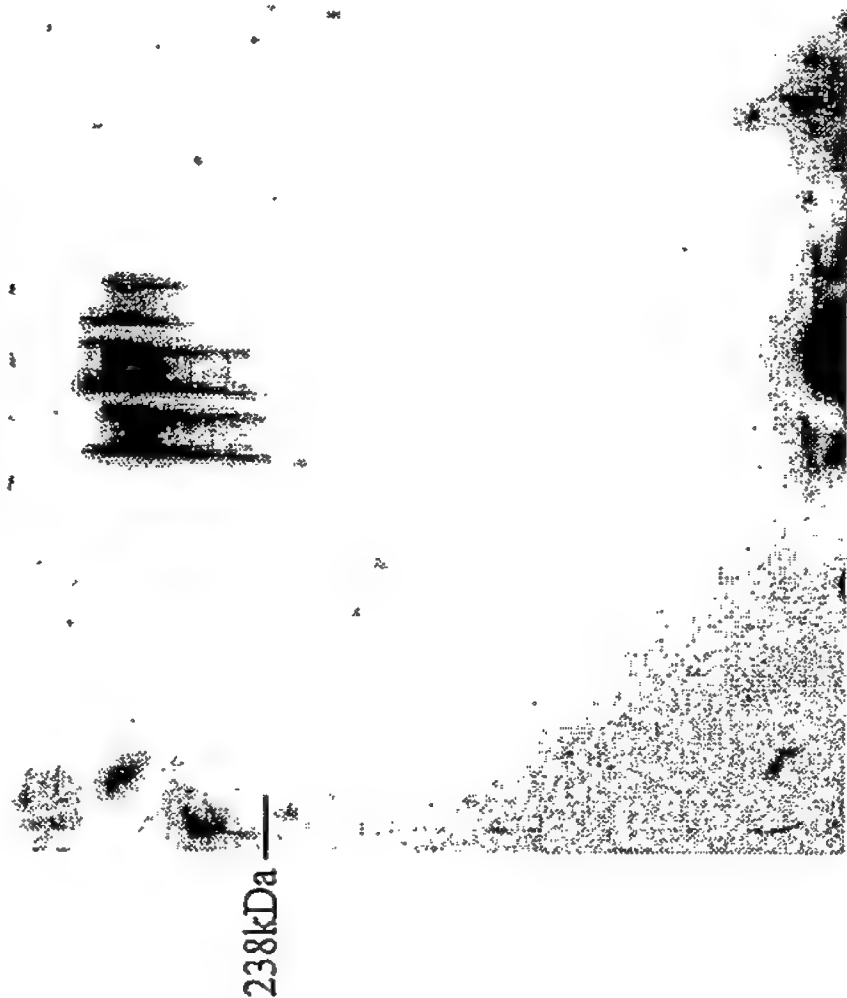


Gel filtration

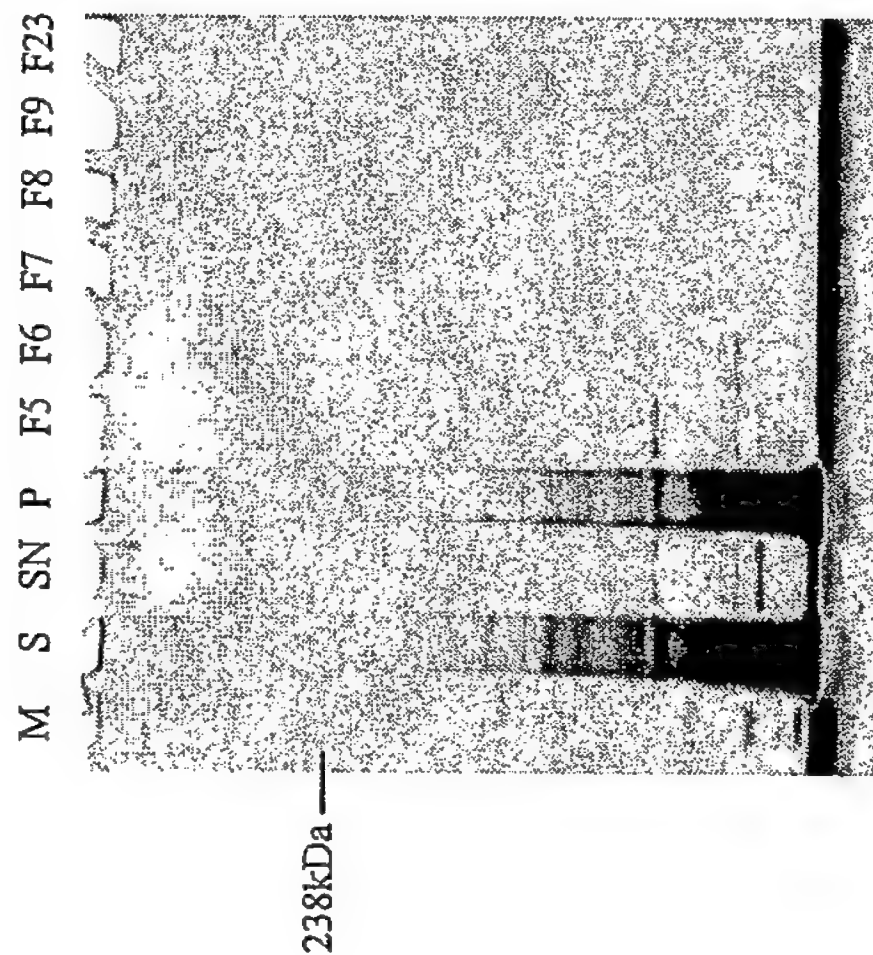


Slot blot (fractions sucrose grad.)

F3 F4 F5 F6 F7

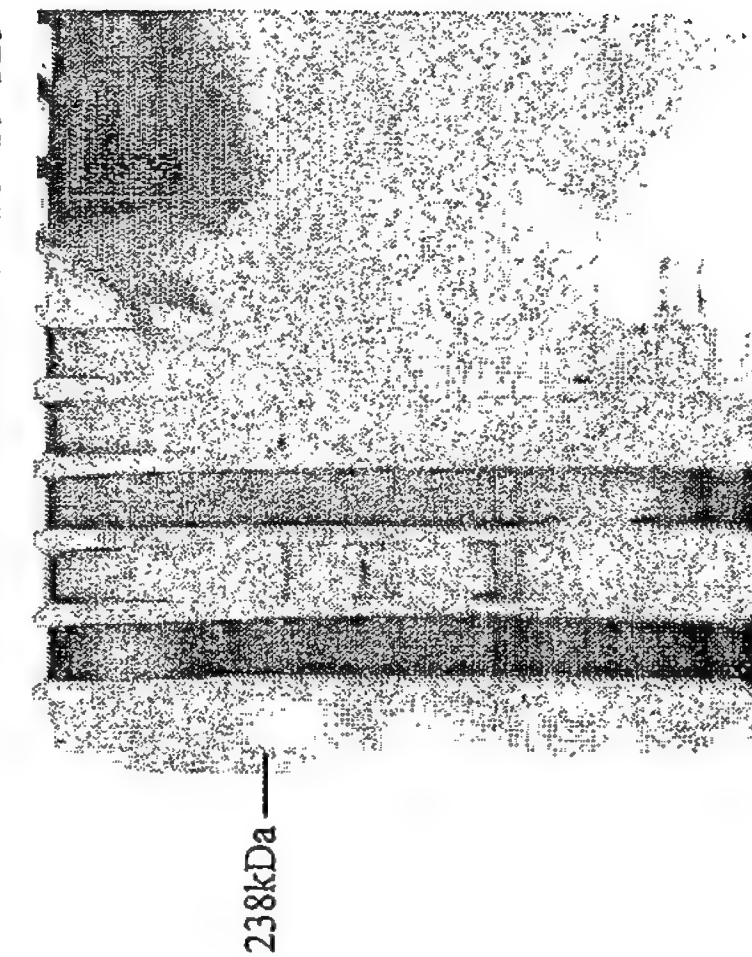


Western (1.AK. α-rrgB)



Coomassie staining

M S SN P F5 F6 F7 F8 F9 F23



Silver Staining

Figure 194





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14CSR -----GTTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC  
670 TGAGTTGTTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC  
6BF -----GTTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC  
6BSP -----GCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC  
19AH -----GTTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC  
23FPO -----TTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC  
19FTW -----TTTTCATTATAAATCTTATGGGACTTTTTTGATACTCAAAAAGC  
9VSP -----TTTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC  
TIGR4 -----TTAGGCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC  
23FTW -----GCGCTTTTCATTATAAGTCTTATGGGACTTTTTTGATACTCAAAAAGC  
\*\*\*\*\*

14CSR CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT  
670 CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT  
6BF CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT  
6BSP CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT  
19AH CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT  
23FPO CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT  
19FTW CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT  
9VSP CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT  
TIGR4 CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT  
23FTW CCTATAATCTCCACAGTGGGATTTACCCACTACAGAAATTATAGAGCCAGAAAAAACACT  
\*\*\*\*\*

14CSR TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCAGATTTACCCAAAAC  
670 TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCAGATTTACCCAAAAC  
6BF TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCAGATTTACCCAAAAC  
6BSP TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCAGATTTACCCAAAAC  
19AH TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCAGATTTACCCAAAAC  
23FPO TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCAGATTTACCCAAAAC  
19FTW TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCAGATTTACCCAAAAC  
9VSP TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCAGATTTACCCAAAAC  
TIGR4 TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCAGATTTACCCAAAAC  
23FTW TTTGTTCACTAGCAGAACTAGAGAGCAGAAGTGTTTTCTGTTTCAGATTTACCCAAAAC  
\*\*\*\*\*

14CSR TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG  
670 TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG  
6BF TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG  
6BSP TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG  
19AH TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG  
23FPO TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG  
19FTW TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG  
9VSP TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG  
TIGR4 TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG  
23FTW TGGGAAATATGGGGATAAGAATAGAGATGGCTTAGGAAGCCCCTTTTTGTGTGTAGACAG  
\*\*\*\*\*

14CSR TACGATGAAC TTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA  
670 TACGATGAAC TTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA  
6BF TACGATGAAC TTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA  
6BSP TACGATGAAC TTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA  
19AH TACGATGAAC TTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA  
23FPO TACGATGAAC TTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA  
19FTW TACGATGAAC TTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA  
9VSP TACGATGAAC TTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA  
TIGR4 TACGATGAAC TTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA  
23FTW TACGATGAAC TTATAACAAATAGTGAGCCTTTTTAGCAATCATTGCGACCCGTTTGTCAA  
\*\*\*\*\*

Figure 196A



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14CSR AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA  
670 AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA  
6BF AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA  
6BSP AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA  
19AH AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA  
23FPO AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA  
19FTW AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA  
9VSP AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA  
TIGR4 AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA  
23FTW AAGCCTCTTTTCGGATATCTACAATTGTCTGATAGATGAGACGCTGTTGGCTAACATGCA  
\*\*\*\*\*

14CSR AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG  
670 AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG  
6BF AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG  
6BSP AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG  
19AH AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG  
23FPO AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG  
19FTW AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG  
9VSP AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG  
TIGR4 AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG  
23FTW AATCTAAGGCAATCGTCAAAAAGTGATGTTCCCTTTGGGATACTGCTTTTTAACGTAAG  
\*\*\*\*\*

14CSR GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG  
670 GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG  
6BF GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG  
6BSP GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG  
19AH GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG  
23FPO GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG  
19FTW GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG  
9VSP GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG  
TIGR4 GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG  
23FTW GCAGGTATTCTTTCGTTGTAATAATAATCAATGGCTCTGTCAAATGCTCCTCTGAAGGAG  
\*\*\*\*\*

14CSR GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA  
670 GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA  
6BF GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA  
6BSP GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA  
19AH GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA  
23FPO GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA  
19FTW GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA  
9VSP GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA  
TIGR4 GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA  
23FTW GAGGACTAATTAGAATATTGTATCCTGTAACAGAGGCAACTTTGTGAGTAAAATTCGGTA  
\*\*\*\*\*

14CSR AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGGA  
670 AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGGA  
6BF AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGGA  
6BSP AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGGA  
19AH AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGGA  
23FPO AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGGA  
19FTW AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGGA  
9VSP AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGGA  
TIGR4 AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGGA  
23FTW AAATAATGGACTTTATTAAGTTTACATCTGCTTGATTATTTAAAATGATAAAAAATCGGGA  
\*\*\*\*\*

Figure 196B

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14CSR TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT  
670 TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT  
6BF TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT  
6BSP TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT  
19AH TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT  
23FPO TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT  
19FTW TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT  
9VSP TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT  
TIGR4 TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT  
23FTW TAGCAGGTAGTGAGGAAAAGATGGTTTCTGTCAAGTAGAGTGAGAAAAGGTACAGCCGAT  
\*\*\*\*\*

14CSR GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTTCG  
670 GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTTCG  
6BF GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTTCG  
6BSP GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTTCG  
19AH GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTTCG  
23FPO GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTTCG  
19FTW GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTTCG  
9VSP GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTTCG  
TIGR4 GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTTCG  
23FTW GCTGGTCGATAACTCCTTCAATCTTCTGCTCAGTCATCCACTCTTGAACAATTGCTTTTCG  
\*\*\*\*\*

14CSR AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTTCGTAATAATTATAATAGG  
670 AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTTCGTAATAATTATAATAGG  
6BF AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTTCGTAATAATTATAATAGG  
6BSP AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTTCGTAATAATTATAATAGG  
19AH AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTTCGTAATAATTATAATAGG  
23FPO AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTTCGTAATAATTATAATAGG  
19FTW AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTTCGTAATAATTATAATAGG  
9VSP AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTTCGTAATAATTATAATAGG  
TIGR4 AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTTCGTAATAATTATAATAGG  
23FTW AAATATGATACAGTGGCTTGTCGCTTTCAATCCCATAATGTTTCGTAATAATTATAATAGG  
\*\*\*\*\*

14CSR GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA  
670 GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA  
6BF GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA  
6BSP GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA  
19AH GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA  
23FPO GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA  
19FTW GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA  
9VSP GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA  
TIGR4 GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA  
23FTW GAACTAGATTTTGTAAACCAAACAAAAACGTTCTTGTTAAGAAAGTCAGTGCTGTTAAAA  
\*\*\*\*\*

14CSR AAGAAAGAGAATTTCGAAATGTCATTTCCCTAAGATATTCTTGAACCTGGATAGTAGATGCT  
670 AAGAAAGAGAATTTCGAAATGTCATTTCCCTAAGATATTCTTGAACCTGGATAGTAGATGCT  
6BF AAGAAAGAGAATTTCGAAATGTCATTTCCCTAAGATATTCTTGAACCTGGATAGTAGATGCT  
6BSP AAGAAAGAGAATTTCGAAATGTCATTTCCCTAAGATATTCTTGAACCTGGATAGTAGATGCT  
19AH AAGAAAGAGAATTTCGAAATGTCATTTCCCTAAGATATTCTTGAACCTGGATAGTAGATGCT  
23FPO AAGAAAGAGAATTTCGAAATGTCATTTCCCTAAGATATTCTTGAACCTGGATAGTAGATGCT  
19FTW AAGAAAGAGAATTTCGAAATGTCATTTCCCTAAGATATTCTTGAACCTGGATAGTAGATGCT  
9VSP AAGAAAGAGAATTTCGAAATGTCATTTCCCTAAGATATTCTTGAACCTGGATAGTAGATGCT  
TIGR4 AAGAAAGAGAATTTCGAAATGTCATTTCCCTAAGATATTCTTGAACCTGGATAGTAGATGCT  
23FTW AAGAAAGAGAATTTCGAAATGTCATTTCCCTAAGATATTCTTGAACCTGGATAGTAGATGCT  
\*\*\*\*\*

Figure 196C



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14CSR TTCCTCTTGATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT  
670 TTCCTCTTGATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT  
6BF TTCCTCTTGATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT  
6BSP TTCCTCTTGATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT  
19AH TTCCTCTTGATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT  
23FPO TTCCTCTTGATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT  
19FTW TTCCTCTTGATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT  
9VSP TTCCTCTTGATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT  
TIGR4 TTCCTCTTGATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT  
23FTW TTCCTCTTGATGCTGAAGAATCAGTTGAATAGTATGAGTCTTTTTTTCTTGATTCCATT  
\*\*\*\*\*

14CSR TGTCTTGGAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT  
670 TGTCTTGGAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT  
6BF TGTCTTGGAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT  
6BSP TGTCTTGGAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT  
19AH TGTCTTGGAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT  
23FPO TGTCTTGGAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT  
19FTW TGTCTTGGAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT  
9VSP TGTCTTGGAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT  
TIGR4 TGTCTTGGAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT  
23FTW TGTCTTGGAACGAAGAATTAGCAGAACAATAAACCAAAAAGATATAATCCAGTTCTT  
\*\*\*\*\*

14CSR CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA  
670 CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA  
6BF CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA  
6BSP CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA  
19AH CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA  
23FPO CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA  
19FTW CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA  
9VSP CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA  
TIGR4 CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA  
23FTW CCTGAGTAAAAGTCATGTTGGCATGTGGCTCTAAGTAAGTTTGGCAATGTTCCATCAAAA  
\*\*\*\*\*

14CSR TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG  
670 TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG  
6BF TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG  
6BSP TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG  
19AH TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG  
23FPO TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG  
19FTW TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG  
9VSP TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG  
TIGR4 TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG  
23FTW TCGGATACATAAAGAGGTTTTTTAATTTTTCAAACCTCTTTGGACTCAGGGAACCTCAAGTG  
\*\*\*\*\*

14CSR GAAATTCCTGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG  
670 GAAATTCCTGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG  
6BF GAAATTCCTGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG  
6BSP GAAATTCCTGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG  
19AH GAAATTCCTGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG  
23FPO GAAATTCCTGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG  
19FTW GAAATTCCTGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG  
9VSP GAAATTCCTGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG  
TIGR4 GAAATTCCTGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG  
23FTW GAAATTCCTGACGTTTCCAAGTGAGTGCCACTAGTATGCTAAAATGAACATACTCGTCAG  
\*\*\*\*\*

Figure 196D



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14CSR GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA  
670 GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA  
6BF GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA  
6BSP GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA  
19AH GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA  
23FPO GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA  
19FTW GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA  
9VSP GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA  
TIGR4 GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA  
23FTW GTGTGATTTCTAACAGTTCATGACTGAGTTGAGAATTAGACTGCACAATCATATGTGTGA  
\*\*\*\*\*

14CSR CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAATGAACTGGAGGA  
670 CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAATGAACTGGAGGA  
6BF CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAATGAACTGGAGGA  
6BSP CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAATGAACTGGAGGA  
19AH CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAATGAACTGGAGGA  
23FPO CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAATGAACTGGAGGA  
19FTW CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAATGAACTGGAGGA  
9VSP CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAATGAACTGGAGGA  
TIGR4 CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAATGAACTGGAGGA  
23FTW CCCAATCCATACTTCCATCATTCAAATCATAAATCTCAATACCAAATGAACTGGAGGA  
\*\*\*\*\*

14CSR GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA  
670 GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA  
6BF GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA  
6BSP GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA  
19AH GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA  
23FPO GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA  
19FTW GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA  
9VSP GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA  
TIGR4 GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA  
23FTW GTGCAATTAAAAAACGAATGCGATATTCAGGACCAACTACTTGATTTTTCACAAGGTCCA  
\*\*\*\*\*

14CSR AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCTGACGCGGTAGCCTGTTGCGATGG  
670 AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCTGACGCGGTAGCCTGTTGCGATGG  
6BF AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCTGACGCGGTAGCCTGTTGCGATGG  
6BSP AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCTGACGCGGTAGCCTGTTGCGATGG  
19AH AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCTGACGCGGTAGCCTGTTGCGATGG  
23FPO AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCTGACGCGGTAGCCTGTTGCGATGG  
19FTW AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCTGACGCGGTAGCCTGTTGCGATGG  
9VSP AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCTGACGCGGTAGCCTGTTGCGATGG  
TIGR4 AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCTGACGCGGTAGCCTGTTGCGATGG  
23FTW AACCTACTGAACGTAGTAACAAGCCACACTTTTGTCTGACGCGGTAGCCTGTTGCGATGG  
\*\*\*\*\*

14CSR AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC  
670 AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC  
6BF AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC  
6BSP AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC  
19AH AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC  
23FPO AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC  
19FTW AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC  
9VSP AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC  
TIGR4 AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC  
23FTW AAATATACTCTTTTGTGTAAATTCGTTAAAGCTTTGATTACCTTGTAGTAGAAAGAAGC  
\*\*\*\*\*

Figure 196E

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14CSR GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT  
670 GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT  
6BF GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT  
6BSP GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT  
19AH GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT  
23FPO GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT  
19FTW GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT  
9VSP GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT  
TIGR4 GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT  
23FTW GGAGTATTTTTAAAATAGTTGATTGGTTATAAAGCTGATGGAAGTAATAATTCGTTTGAT  
\*\*\*\*\*

14CSR GAGAATGGTGTTCGATTAATTGAACCTTGTTCGTATCTAAATTAAATGTCAACTCTTCCT  
670 GAGAATGGTGTTCGATTAATTGAACCTTGTTCGTATCTAAATTAAATGTCAACTCTTCCT  
6BF GAGAATGGTGTTCGATTAATTGAACCTTGTTCGTATCTAAATTAAATGTCAACTCTTCCT  
6BSP GAGAATGGTGTTCGATTAATTGAACCTTGTTCGTATCTAAATTAAATGTCAACTCTTCCT  
19AH GAGAATGGTGTTCGATTAATTGAACCTTGTTCGTATCTAAATTAAATGTCAACTCTTCCT  
23FPO GAGAATGGTGTTCGATTAATTGAACCTTGTTCGTATCTAAATTAAATGTCAACTCTTCCT  
19FTW GAGAATGGTGTTCGATTAATTGAACCTTGTTCGTATCTAAATTAAATGTCAACTCTTCCT  
9VSP GAGAATGGTGTTCGATTAATTGAACCTTGTTCGTATCTAAATTAAATGTCAACTCTTCCT  
TIGR4 GAGAATGGTGTTCGATTAATTGAACCTTGTTCGTATCTAAATTAAATGTCAACTCTTCCT  
23FTW GAGAATGGTGTTCGATTAATTGAACCTTGTTCGTATCTAAATTAAATGTCAACTCTTCCT  
\*\*\*\*\*

14CSR CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA  
670 CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA  
6BF CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA  
6BSP CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA  
19AH CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA  
23FPO CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA  
19FTW CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA  
9VSP CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA  
TIGR4 CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA  
23FTW CGAATGTTTCTTGTAATTCCTGCAAAATGCTTAGGAGACTTTTAGATTGTAATGAAGTTA  
\*\*\*\*\*

14CSR AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA  
670 AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA  
6BF AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA  
6BSP AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA  
19AH AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA  
23FPO AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA  
19FTW AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA  
9VSP AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA  
TIGR4 AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA  
23FTW AAGTAGACAGTTCATCTAGTTCAATAGACCGAATATCCAATAATATATTTAAAATGGTAA  
\*\*\*\*\*

14CSR TTTTATCTGTAATTCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC  
670 TTTTATCTGTAATTCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC  
6BF TTTTATCTGTAATTCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC  
6BSP TTTTATCTGTAATTCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC  
19AH TTTTATCTGTAATTCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC  
23FPO TTTTATCTGTAATTCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC  
19FTW TTTTATCTGTAATTCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC  
9VSP TTTTATCTGTAATTCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC  
TIGR4 TTTTATCTGTAATTCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC  
23FTW TTTTATCTGTAATTCTTTTTCAATGTATTTGTTTAGCATAGTTACCGAATCTTAGTTGC  
\*\*\*\*\*

Figure 196F



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14CSR      ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
670        ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
6BF        ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
6BSP       ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
19AH       ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
23FPO      ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
19FTW      ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
9VSP       ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
TIGR4      ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
23FTW      ATATAGATAATTTTAATTATTATAATACAAAAGAACTAATTGTCTTGTCAAAAAGGTTG
*****

14CSR      TGG AATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
670        TGG AATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
6BF        TGG AATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
6BSP       TGG AATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
19AH       TGG AATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
23FPO      TGG AATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
19FTW      TGG AATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
9VSP       TGG AATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
TIGR4      TGG AATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
23FTW      TGG AATTTCCGACTTTATTGATAAAACAGCATGTAATAAAAGGCATTTTAAAGATAGTAA
*****

14CSR      TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTTATCAAAT
670        TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTTATCAAAT
6BF        TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTTATCAAAT
6BSP       TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTTATCAAAT
19AH       TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTTATCAAAT
23FPO      TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTTATCAAAT
19FTW      TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTTATCAAAT
9VSP       TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTTATCAAAT
TIGR4      TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTTATCAAAT
23FTW      TGAGTATTGGTGGAGTTTATGGCTTATTTTTTTTATTAGAAAATATTTTTTTTATCAAAT
*****

14CSR      ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
670        ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
6BF        ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
6BSP       ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
19AH       ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
23FPO      ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
19FTW      ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
9VSP       ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
TIGR4      ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
23FTW      ATTGTCGTTCTATAAAAAAATATGTGATAAAAAATATCTATTGTGATGGAAGTTGTTTTAA
*****

14CSR      TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
670        TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
6BF        TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
6BSP       TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
19AH       TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
23FPO      TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
19FTW      TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
9VSP       TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
TIGR4      TTTATACTAGGATAGTTAATAGTAATACTATACTATACTATATTGTATACAAGTGTGTCA
23FTW      TTTATACTAGGATAGTTAATAGTAATACTATACTA-----TATTGTATACAAGTGTGTCA
*****
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Figure 196G



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14CSR TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTTAGT  
670 TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTTAGT  
6BF TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTTAGT  
6BSP TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTTAGT  
19AH TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTTAGT  
23FPO TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTTAGT  
19FTW TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTTAGT  
9VSP TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTTAGT  
TIGR4 TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTTAGT  
23FTW TTGCCAGGTTGAGAAGATAGCTATAACGCACCTTTTATACGCTTTTGCTACGTTTGTTAGT  
\*\*\*\*\*

14CSR GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT  
670 GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT  
6BF GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT  
6BSP GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT  
19AH GAACGGATTAACCTCAGCATGAGATAAATTTTATCAGAA--TAAGTAATCCGTTTCTTCGT  
23FPO GAACGGATTAACCTCAGCATGAGATAAATTTTATCAGAA--TAAGTAATCCGTTTCTTCGT  
19FTW GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT  
9VSP GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT  
TIGR4 GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT  
23FTW GAACGGATTAACCTCAG--TGAGATAAATTTTATCAGAACATAAGTAATCCGTTTCTTCGT  
\*\*\*\*\*

14CSR GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCTATGAATAATGC  
670 GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCTATGAATAATGC  
6BF GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCTATGAATAATGC  
6BSP GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCTATGAATAATGC  
19AH GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCTATGAATAATGC  
23FPO GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCTATGAATAATGC  
19FTW GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCTATGAATAATGC  
9VSP GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCTATGAATAATGC  
TIGR4 GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCTATGAATAATGC  
23FTW GTATACAGATTGAAAGTACCTATGAATCATAGAAGGATTAACCTTGTTCTATGAATAATGC  
\*\*\*\*\*

14CSR TTAACAGGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC  
670 TTAACAGGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC  
6BF TTAACAGGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC  
6BSP TTAACAGGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC  
19AH TTAACAGGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC  
23FPO TTAACAGGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC  
19FTW TTAACAGGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC  
9VSP TTAACAGGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC  
TIGR4 TTAACAGGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC  
23FTW TTAACAGGGGAGACACACATGAAAAAAGTAAGAAAGATATTTT CAGAAGGCAGTTGCAGGAC  
\*\*\*\*\*

14CSR TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG  
670 TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG  
6BF TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG  
6BSP TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG  
19AH TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG  
23FPO TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG  
19FTW TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG  
9VSP TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG  
TIGR4 TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG  
23FTW TGTGCTGTATATCTCAGTTGACAGCTTTTTCTTCGATAGTTGCTTTAGCAGAAACGCCTG  
\*\*\*\*\*

Figure 196H

PCT/US2005/027239

14CSR AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC  
670 AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC  
6BF AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC  
6BSP AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC  
19AH AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC  
23FPO AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC  
19FTW AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC  
9VSP AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC  
TIGR4 AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC  
23FTW AAACCAGTCCAGCGATAGGAAAAGTAGTGATTAAGGAGACAGGCGAAGGAGGAGCGCTTC  
\*\*\*\*\*

14CSR TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA  
670 TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA  
6BF TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA  
6BSP TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA  
19AH TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA  
23FPO TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA  
19FTW TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA  
9VSP TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGAATGGCACAACCTGTTTCGCAAAGGA  
TIGR4 TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA  
23FTW TAGGAGATGCCGTCTTTGAGTTGAAAAACAATACGGATGGCACAACCTGTTTCGCAAAGGA  
\*\*\*\*\*

14CSR CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA  
670 CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA  
6BF CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA  
6BSP CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA  
19AH CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA  
23FPO CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA  
19FTW CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA  
9VSP CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA  
TIGR4 CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA  
23FTW CAGAGGCGCAAACAGGAGAAGCGATATTTTCAAACATAAAACCTGGGACATACACCTTGA  
\*\*\*\*\*

14CSR CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG  
670 CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG  
6BF CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG  
6BSP CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG  
19AH CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG  
23FPO CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG  
19FTW CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG  
9VSP CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAACGGACTGTTGAAGTTG  
TIGR4 CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG  
23FTW CAGAAGCCCAACCTCCAGTTGGTTATAAACCTCTACTAAACAATGGACTGTTGAAGTTG  
\*\*\*\*\*

14CSR AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT  
670 AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT  
6BF AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT  
6BSP AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT  
19AH AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT  
23FPO AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT  
19FTW AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT  
9VSP AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT  
TIGR4 AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT  
23FTW AGAAGAATGGTCGGACGACTGTCCAAGGTGAACAGGTAGAAAATCGAGAAGAGGCTCTAT  
\*\*\*\*\*

Figure 196I



PCT/US05/27239

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14CSR      CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
670        CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
6BF        CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
6BSP       CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
19AH       CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
23FPO      CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
19FTW      CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
9VSP       CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
TIGR4      CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
23FTW      CTGACCAGTATCCACAAACAGGGACTTATCCAGATGTTCAAACACCTTATCAGATTATTA
*****

14CSR      AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
670        AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
6BF        AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
6BSP       AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
19AH       AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
23FPO      AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
19FTW      AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
9VSP       AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
TIGR4      AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
23FTW      AGGTAGATGGTTCGGAAAAAACGGACAGCACAAGGCGTTGAATCCGAATCCATATGAAC
*****

14CSR      GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
670        GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
6BF        GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
6BSP       GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
19AH       GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
23FPO      GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
19FTW      GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
9VSP       GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
TIGR4      GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
23FTW      GTGTGATTCCAGAAGGTACACTTTCAAAGAGAATTTATCAAGTGAATAATTTGGATGATA
*****

14CSR      ACCAATATGGAATCGAGTTGACGGTTAGTGTTAAACGACGGTTGAAACGAAAGAAGCCT
670        ACCAATATGGAATCGAGTTGACGGTTAGTGTTAAACGACGGTTGAAACGAAAGAAGCCT
6BF        ACCAATATGGAATCGAGTTGACGGTTAGTGTTAAACGACGGTTGAAACGAAAGAAGCCT
6BSP       ACCAATATGGAATCGAGTTGACGGTTAGTGTTAAACGACGGTTGAAACGAAAGAAGCCT
19AH       ACCAATATGGAATCGAGTTGACGGTTAGTGTTAAACGACGGTTGAAACGAAAGAAGCCT
23FPO      ACCAATATGGAATCGAGTTGACGGTTAGTGTTAAACGACGGTTGAAACGAAAGAAGCCT
19FTW      ACCAATATGGAATCGAATTGACGGTTAGTGGGAAAACAGTGTATGAACGAAAAGATAAGT
9VSP       ACCAATATGGAATCGAATTGACGGTTAGTGGGAAAACAGTGTATGAACGAAAAGATAAGT
TIGR4      ACCAATATGGAATCGAATTGACGGTTAGTGGGAAAACAGTGTATGAACGAAAAGATAAGT
23FTW      ACCAATATGGAATCGAATTGACGGTTAGTGGGAAAACAGTGTATGAACGAAAAGATAAGT
*****

14CSR      CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC
670        CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC
6BF        CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC
6BSP       CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC
19AH       CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC
23FPO      CTACTCCGCTAGATGTTGTTATTCTATTAGATAACTCCAATAGTATGAGTAATATTCGAC
19FTW      CTGTGCCGCTGGATGTCGTTATCTTGCTCGATAACTCAAATAGTATGAGTAACATTCGAA
9VSP       CTGTGCCGCTGGATGTCGTTATCTTGCTCGATAACTCAAATAGTATGAGTAACATTCGAA
TIGR4      CTGTGCCGCTGGATGTCGTTATCTTGCTCGATAACTCAAATAGTATGAGTAACATTCGAA
23FTW      CTGTGCCGCTGGATGTCGTTATCTTGCTCGATAACTCAAATAGTATGAGTAACATTCGAA
**      *****
```

Figure 196J



14CSR	ATAATCATGCCCATCGAGCGGAAAAAGCGGGAGAAGCGACACGAGCCCTTGTAGATAAGA
670	ATAATCATGCCCATCGAGCGGAAAAAGCGGGAGAAGCGACACGAGCCCTTGTAGATAAGA
6BF	ATAATCATGCCCATCGAGCGGAAAAAGCGGGAGAAGCGACACGAGCCCTTGTAGATAAGA
6BSP	ATAATCATGCCCATCGAGCGGAAAAAGCGGGAGAAGCGACACGAGCCCTTGTAGATAAGA
19AH	ATAATCATGCCCATCGAGCGGAAAAAGCGGGAGAAGCGACACGAGCCCTTGTAGATAAGA
23FPO	ATAATCATGCCCATCGAGCGGAAAAAGCGGGAGAAGCGACACGAGCCCTTGTAGATAAGA
19FTW	ACAAGAATGCTCGACGTGCGGAAAGAGCTGGTGAGGCGACACGTTCTCTTATTGATAAAA
9VSP	ACAAGAATGCTCGACGTGCGGAAAGAGCTGGTGAGGCGACACGTTCTCTTATTGATAAAA
TIGR4	ACAAGAATGCTCGACGTGCGGAAAGAGCTGGTGAGGCGACACGTTCTCTTATTGATAAAA
23FTW	ACAAGAATGCTCGACGTGCGGAAAGAGCTGGTGAGGCGACACGTTCTCTTATTGATAAAA
	* ** ***** * ** ***** ** * * * ***** * ** * *****
14CSR	TTACCTCCAATCCAGATAATCGAGTAGCACTTGTGACTTATGGCTCAACTATCTTTGACG
670	TTACCTCCAATCCAGATAATCGAGTAGCACTTGTGACTTATGGCTCAACTATCTTTGACG
6BF	TTACCTCCAATCCAGATAATCGAGTAGCACTTGTGACTTATGGCTCAACTATCTTTGACG
6BSP	TTACCTCCAATCCAGATAATCGAGTAGCACTTGTGACTTATGGCTCAACTATCTTTGACG
19AH	TTACCTCCAATCCAGATAATCGAGTAGCACTTGTGACTTATGGCTCAACTATCTTTGACG
23FPO	TTACCTCCAATCCAGATAATCGAGTAGCACTTGTGACTTATGGCTCAACTATCTTTGACG
19FTW	TTACATCTGATCCAGAAAATAGGGTAGCGCTTGTGACTTATGCTTCCACTATCTTTGATG
9VSP	TTACATCTGATCCAGAAAATAGGGTAGCGCTTGTGACTTATGCTTCCACTATCTTTGATG
TIGR4	TTACATCTGATTCAGAAAATAGGGTAGCGCTTGTGACTTATGCTTCCACTATCTTTGATG
23FTW	TTACATCTGATCCAGAAAATAGGGTAGCGCTTGTGACTTATGCTTCCACTATCTTTGATG
	**** * * ** ***** * * ***** ***** ***** * * ***** *
14CSR	G TTCAGAAGCTACTGTGGAAAAAGGGGTAGCAGATGCGAACGGAAAAATATTGAATGACT
670	G TTCAGAAGCTACTGTGGAAAAAGGGGTAGCAGATGCGAACGGAAAAATATTGAATGACT
6BF	G TTCAGAAGCTACTGTGGAAAAAGGGGTAGCAGATGCGAACGGAAAAATATTGAATGACT
6BSP	G TTCAGAAGCTACTGTGGAAAAAGGGGTAGCAGATGCGAACGGAAAAATATTGAATGACT
19AH	G TTCAGAAGCTACTGTGGAAAAAGGGGTAGCAGATGCGAACGGAAAAATATTGAATGACT
23FPO	G TTCAGAAGCTACTGTGGAAAAAGGGGTAGCAGATGCGAACGGAAAAATATTGAATGACT
19FTW	GGACCGAGTTTACAGTAGAAAAAGGGGTAGCAGATAAAAACGGAAAACGATTGAATGATT
9VSP	GGACCGAGTTTACAGTAGAAAAAGGGGTAGCAGATAAAAACGGAAAACGATTGAATGATT
TIGR4	GGACCGAGTTTACAGTAGAAAAAGGGGTAGCAGATAAAAACGGAAAGCGATTGAATGATT
23FTW	GGACCGAGTTTACAGTAGAAAAAGGGGTAGCAGATAAAAACGGAAAACGATTGAATGATT
	* * * * ** * * ***** ***** ***** ***** *
14CSR	CAGCTTTATGGACGTTTCGATCGTACGACGTTTACAGCTAAAACTTATAATTATAGCTTTT
670	CAGCTTTATGGACGTTTCGATCGTACGACGTTTACAGCTAAAACTTATAATTATAGCTTTT
6BF	CAGCTTTATGGACGTTTCGATCGTACGACGTTTACAGCTAAAACTTATAATTATAGCTTTT
6BSP	CAGCTTTATGGACGTTTCGATCGTACGACGTTTACAGCTAAAACTTATAATTATAGCTTTT
19AH	CAGCTTTATGGACGTTTCGATCGTACGACGTTTACAGCTAAAACTTATAATTATAGCTTTT
23FPO	CAGCTTTATGGACGTTTCGATCGTACGACGTTTACAGCTAAAACTTATAATTATAGCTTTT
19FTW	CTCTTTTTTTGGAATTATGATCAGACGAGTTTTTACAACCAATACCAAAGATTATAGTTATT
9VSP	CTCTTTTTTTGGAATTATGATCAGACGAGTTTTTACAACCAATACCAAAGATTATAGTTATT
TIGR4	CTCTTTTTTTGGAATTATGATCAGACGAGTTTTTACAACCAATACCAAAGATTATAGTTATT
23FTW	CTCTTTTTTTGGAATTATGATCAGACGAGTTTTTACAACCAATACCAAAGATTATAGTTATT
	* ** *
14CSR	TAAATCTCACATCAGATCCTACTGATATTCAAACCTATTAAGGATAGGATTCCATCAGATG
670	TAAATCTCACATCAGATCCTACTGATATTCAAACCTATTAAGGATAGGATTCCATCAGATG
6BF	TAAATCTCACATCAGATCCTACTGATATTCAAACCTATTAAGGATAGGATTCCATCAGATG
6BSP	TAAATCTCACATCAGATCCTACTGATATTCAAACCTATTAAGGATAGGATTCCATCAGATG
19AH	TAAATCTCACATCAGATCCTACTGATATTCAAACCTATTAAGGATAGGATTCCATCAGATG
23FPO	TAAATCTCACATCAGATCCTACTGATATTCAAACCTATTAAGGATAGGATTCCATCAGATG
19FTW	TAAAGCTGACTAATGATAAGAATGACATTGTAGAATTAAAAAATAAGGTACCTACCGAGG
9VSP	TAAAGCTGACTAATGATAAGAATGACATTGTAGAATTAAAAAATAAGGTACCTACCGAGG
TIGR4	TAAAGCTGACTAATGATAAGAATGACATTGTAGAATTAAAAAATAAGGTACCTACCGAGG
23FTW	TAAAGCTGACTAATGATAAGAATGACATTGTAGAATTAAAAAATAAGGTACCTACCGAGG
	**** *

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14CSR CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTCGGCGCGACTTTTACCCAGAAGG  
670 CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTCGGCGCGACTTTTACCCAGAAGG  
6BF CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTCGGCGCGACTTTTACCCAGAAGG  
6BSP CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTCGGCGCGACTTTTACCCAGAAGG  
19AH CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTCGGCGCGACTTTTACCCAGAAGG  
23FPO CAGAGGAATTGAACAAAGACAAATTGATGTATCAATTCGGCGCGACTTTTACCCAGAAGG  
19FTW CAGAAGATCATGATGGAAATAGATTGATGTACCAATTCGGTGCCACTTTTACTCAGAAAG  
9VSP CAGAAGACCATGATGGAAATAGATTGATGTACCAATTCGGTGCCACTTTTACTCAGAAAG  
TIGR4 CAGAAGACCATGATGGAAATAGATTGATGTACCAATTCGGTGCCACTTTTACTCAGAAAG  
23FTW CAGAAGACCATGATGGAAATAGATTGATGTACCAATTCGGTGCCACTTTTACTCAGAAAG  
\*\*\*\*\* \*\* \*

14CSR CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA  
670 CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA  
6BF CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA  
6BSP CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA  
19AH CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA  
23FPO CTTTGATGACCGCTGATGATATCTTGACAAAGCAGGCAAGACCAAACAGTAAAAAGGTTA  
19FTW CTTTGATGAAGGCAGATGAGATTTTGACACAACAAGCGAGACAAAATAGTCAAAAAGTCA  
9VSP CTTTGATGAAGGCCGATGAGATTTTGACACAACAAGCGAGACAAAATAGTCAAAAAGTCA  
TIGR4 CTTTGATGAAGGCAGATGAGATTTTGACACAACAAGCGAGACAAAATAGTCAAAAAGTCA  
23FTW CTTTGATGAAGGCAGATGAGATTTTGACACAACAAGCGAGACAAAATAGTCAAAAAGTCA  
\*\*\*\*\* \*\* \*

14CSR TTTTCCACATTACAGATGGTGTTCGCGACTATGTCATATCCAATTAATTTTAAATATACAG  
670 TTTTCCACATTACAGATGGTGTTCGCGACTATGTCATATCCAATTAATTTTAAATATACAG  
6BF TTTTCCACATTACAGATGGTGTTCGCGACTATGTCATATCCAATTAATTTTAAATATACAG  
6BSP TTTTCCACATTACAGATGGTGTTCGCGACTATGTCATATCCAATTAATTTTAAATATACAG  
19AH TTTTCCACATTACAGATGGTGTTCGCGACTATGTCATATCCAATTAATTTTAAATATACAG  
23FPO TTTTCCACATTACAGATGGTGTTCGCGACTATGTCATATCCAATTAATTTTAAATATACAG  
19FTW TTTTCCATATTACGGATGGTGTCCCAACTATGTCGATCCGATTAATTTTAAATCATGCTA  
9VSP TTTTCCATATTACGGATGGTGTCCCAACTATGTCGATCCGATTAATTTTAAATCATGCTA  
TIGR4 TTTTCCATATTACGGATGGTGTCCCAACTATGTCGATCCGATTAATTTTAAATCATGCTA  
23FTW TTTTCCATATTACGGATGGTGTCCCAACTATGTCGATCCGATTAATTTTAAATCATGCTA  
\*\*\*\*\* \*

14CSR GAACGACGCAATCGTACAGAACTCAGCTGAATA-ATTTTAAAGCAAAAACCTCCAAATAGT  
670 GAACGACGCAATCGTACAGAACTCAGCTGAATA-ATTTTAAAGCAAAAACCTCCAAATAGT  
6BF GAACGACGCAATCGTACAGAACTCAGCTGAATA-ATTTTAAAGCAAAAACCTCCAAATAGT  
6BSP GAACGACGCAATCGTACAGAACTCAGCTGAATA-ATTTTAAAGCAAAAACCTCCAAATAGT  
19AH GAACGACGCAATCGTACAGAACTCAGCTGAATA-ATTTTAAAGCAAAAACCTCCAAATAGT  
23FPO GAACGACGCAATCGTACAGAACTCAGCTGAATA-ATTTTAAAGCAAAAACCTCCAAATAGT  
19FTW CGTTTGCTCCATCATATCAAAATCAACTAAATGCATTTTTTTAGTAAAT-CTCCTAATAAA  
9VSP CGTTTGCTCCATCATATCAAAATCAACTAAATGCATTTTTTTAGTAAAT-CTCCTAATAAA  
TIGR4 CGTTTGCTCCATCATATCAAAATCAACTAAATGCATTTTTTTAGTAAAT-CTCCTAATAAA  
23FTW CGTTTGCTCCATCATATCAAAATCAACTAAATGCATTTTTTTAGTAAAT-CTCCTAATAAA  
\* \*

14CSR AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT  
670 AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT  
6BF AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT  
6BSP AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT  
19AH AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT  
23FPO AGCGGGATATTACTGGAGGACTTTGTTACATGGTCAGCAGATGGTGAACATAAGATTGTT  
19FTW GATGGAATACTATTAAAGTGATTTTATTACGCAAGCAACTAGTGGAGAACATACAATTGTA  
9VSP GATGGAATACTATTAAAGTGATTTTATTACGCAAGCAACTAGTGGAGAACATACAATTGTA  
TIGR4 GATGGAATACTATTAAAGTGATTTTATTACGCAAGCAACTAGTGGAGAACATACAATTGTA  
23FTW GATGGAATACTATTAAAGTGATTTTATTACGCAAGCAACTAGTGGAGAACATACAATTGTA  
\* \*

Figure 196L



14CSR	CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT-----AACAGACCAA
670	CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT-----AACAGACCAA
6BF	CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT-----AACAGACCAA
6BSP	CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT-----AACAGACCAA
19AH	CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT-----AACAGACCAA
23FPO	CGTGGAGATGGTGAAAGTTATCAGATGTTTACGAAGAAACCTGT-----AACAGACCAA
19FTW	CGCGGAGATGGGCAAAGTTACCAGATGTTTACAGATAAGACAGTTTATGAAAAAGGTGCT
9VSP	CGCGGAGATGGGCAAAGTTACCAGATGTTTACAGATAAGACAGTTTATGAAAAAGGTGCT
TIGR4	CGCGGAGATGGGCAAAGTTACCAGATGTTTACAGATAAGACAGTTTATGAAAAAGGTGCT
23FTW	CGCGGAGATGGGCAAAGTTACCAGATGTTTACAGATAAGACAGTTTATGAAAAAGGTGCT
	** *****
14CSR	TACGGAGTTCATCAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT
670	TACGGAGTTCATCAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT
6BF	TACGGAGTTCATCAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT
6BSP	TACGGAGTTCATCAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT
19AH	TACGGAGTTCATCAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT
23FPO	TACGGAGTTCATCAAAT---ACTTTCAATCACCTCCATGGAGCAGAGAGCTAAATTAGTT
19FTW	CCTGCAGCTTTCCAGTTAAACCTGAAAAATATTCTGAAATGAAGGCGGTTGGTTATGCA
9VSP	CCTGCAGCTTTCCAGTTAAACCTGAAAAATATTCTGAAATGAAGGCGGTTGGTTATGCA
TIGR4	CCTGCAGCTTTCCAGTTAAACCTGAAAAATATTCTGAAATGAAGGCGGCTGGTTATGCA
23FTW	CCTGCAGCTTTCCAGTTAAACCTGAAAAATATTCTGAAATGAAGGCGGCTGGTTATGCA
	* ** * * * * * * * * * * * * *
14CSR	TCAGCGGGATATAGGTTCTATGGAACCTGACTTGTATTTATATTGGCGTGATAGTATTCTA
670	TCAGCGGGATATAGGTTCTATGGAACCTGACTTGTATTTATATTGGCGTGATAGTATTCTA
6BF	TCAGCGGGATATAGGTTCTATGGAACCTGACTTGTATTTATATTGGCGTGATAGTATTCTA
6BSP	TCAGCGGGATATAGGTTCTATGGAACCTGACTTGTATTTATATTGGCGTGATAGTATTCTA
19AH	TCAGCGGGATATAGGTTCTATGGAACCTGACTTGTATTTATATTGGCGTGATAGTATTCTA
23FPO	TCAGCGGGATATAGGTTCTATGGAACCTGACTTGTATTTATATTGGCGTGATAGTATTCTA
19FTW	GTTATAGGCGATCCAATTAATGGTGGATATATTTGGCTTAATTGGAGAGAGAGTATTCTG
9VSP	GTTATAGGCGATCCAATTAATGGTGGATATATTTGGCTTAATTGGAGAGAGAGTATTCTG
TIGR4	GTTATAGGCGATCCAATTAATGGTGGATATATTTGGCTTAATTGGAGAGAGAGTATTCTG
23FTW	GTTATAGGCGATCCAATTAATGGTGGATATATTTGGCTTAATTGGAGAGAGAGTATTCTG
	** ** * * * * * * * * * * * * *
14CSR	GCCTATCCATTTAACTCTAGTACCGATTGGATTACCAACCATGGTGACCCTACGACTTGG
670	GCCTATCCATTTAACTCTAGTACCGATTGGATTACCAACCATGGTGACCCTACGACTTGG
6BF	GCCTATCCATTTAACTCTAGTACCGATTGGATTACCAACCATGGTGACCCTACGACTTGG
6BSP	GCCTATCCATTTAACTCTAGTACCGATTGGATTACCAACCATGGTGACCCTACGACTTGG
19AH	GCCTATCCATTTAACTCTAGTACCGATTGGATTACCAACCATGGTGACCCTACGACTTGG
23FPO	GCCTATCCATTTAACTCTAGTACCGATTGGATTACCAACCATGGTGACCCTACGACTTGG
19FTW	GCTTATCCGTTTAACTCTAATACTGCTAAAATTACCAATCATGGTGCCCCTACAAGATGG
9VSP	GCTTATCCGTTTAACTCTAATACTGCTAAAATTACCAATCATGGTGACCCTACAAGATGG
TIGR4	GCTTATCCGTTTAACTCTAATACTGCTAAAATTACCAATCATGGTGACCCTACAAGATGG
23FTW	GCTTATCCGTTTAACTCTAATACTGCTAAAATTACCAATCATGGTGACCCTACAAGATGG
	** *****
14CSR	TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA
670	TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA
6BF	TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA
6BSP	TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA
19AH	TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA
23FPO	TATTATAACGGAAATATGGCTCAGGATGGCTATGATGTCTTCACTGTTGGGGTTGGTGTA
19FTW	TACTATAACGGGAATATTGCTCCTGATGGGTATGATGTCTTTACGGTAGGTATTGGTATT
9VSP	TACTATAACGGGAATATTGCTCCTGATGGGTATGATGTCTTTACGGTAGGTATTGGTATT
TIGR4	TACTATAACGGGAATATTGCTCCTGATGGGTATGATGTCTTTACGGTAGGTATTGGTATT
23FTW	TACTATAACGGGAATATTGCTCCTGATGGGTATGATGTCTTTACGGTAGGTATTGGTATT
	** *****



14CSR AACGGGGATCCTGGTACGGATGAAGCAACGGCTACTAGATTTATGCAGAGCATCTCTAGT  
670 AACGGGGATCCTGGTACGGATGAAGCAACGGCTACTAGATTTATGCAGAGCATCTCTAGT  
6BF AACGGGGATCCTGGTACGGATGAAGCAACGGCTACTAGATTTATGCAGAGCATCTCTAGT  
6BSP AACGGGGATCCTGGTACGGATGAAGCAACGGCTACTAGATTTATGCAGAGCATCTCTAGT  
19AH AACGGGGATCCTGGTACGGATGAAGCAACGGCTACTAGATTTATGCAGAGCATCTCTAGT  
23FPO AACGGGGATCCTGGTACGGATGAAGCAACGGCTACTAGATTTATGCAGAGCATCTCTAGT  
19FTW AACGGGAGATCCTGGTACGGATGAAGCAACGGCTACTAGTTTTATGCAAAGTATTTCTAGT  
9VSP AACGGGAGATCCTGGTACGGATGAAGCAACGGCTACTAGTTTTATGCAAAGTATTTCTAGT  
TIGR4 AACGGGAGATCCTGGTACGGATGAAGCAACGGCTACTAGTTTTATGCAAAGTATTTCTAGT  
23FTW AACGGGAGATCCTGGTACGGATGAAGCAACGGCTACTAGTTTTATGCAAAGTATTTCTAGT  
\*\*\*\*\*

14CSR TCTCCTGACAACTACACTAACGTAGCAGATCCATCTCAGATTTTACAAGAATTGAATCGC  
670 TCTCCTGACAACTACACTAACGTAGCAGATCCATCTCAGATTTTACAAGAATTGAATCGC  
6BF TCTCCTGACAACTACACTAACGTAGCAGATCCATCTCAGATTTTACAAGAATTGAATCGC  
6BSP TCTCCTGACAACTACACTAACGTAGCAGATCCATCTCAGATTTTACAAGAATTGAATCGC  
19AH TCTCCTGACAACTACACTAACGTAGCAGATCCATCTCAGATTTTACAAGAATTGAATCGC  
23FPO TCTCCTGACAACTACACTAACGTAGCAGATCCATCTCAGATTTTACAAGAATTGAATCGC  
19FTW AAACCTGAAAACCTATACCAATGTTACTGACACGACAAAAATATTGGAACAGTTGAATCGT  
9VSP AAACCTGAAAACCTATACCAATGTTACTGACACGACAAAAATATTGGAACAGTTGAATCGT  
TIGR4 AAACCTGAAAACCTATACCAATGTTACTGACACGACAAAAATATTGGAACAGTTGAATCGT  
23FTW AAACCTGAAAACCTATACCAATGTTACTGACACGACAAAAATATTGGAACAGTTGAATCGT  
\*\*\*\*\*

14CSR TACTTCTATACTATCGTCAATGAGAAGAAATCTATCGAAAATGGTACGATTACAGACCCG  
670 TACTTCTATACTATCGTCAATGAGAAGAAATCTATCGAAAATGGTACGATTACAGACCCG  
6BF TACTTCTATACTATCGTCAATGAGAAGAAATCTATCGAAAATGGTACGATTACAGACCCG  
6BSP TACTTCTATACTATCGTCAATGAGAAGAAATCTATCGAAAATGGTACGATTACAGACCCG  
19AH TACTTCTATACTATCGTCAATGAGAAGAAATCTATCGAAAATGGTACGATTACAGACCCG  
23FPO TACTTCTATACTATCGTCAATGAGAAGAAATCTATCGAAAATGGTACGATTACAGACCCG  
19FTW TATTTCCACACCATCGTAACTGAAAAGAAATCAATTGAGAATGGTACGATTACAGATCCG  
9VSP TATTTCCACACCATCGTAACTGAAAAGAAATCAATTGAGAATGGTACGATTACAGATCCG  
TIGR4 TATTTCCACACCATCGTAACTGAAAAGAAATCAATTGAGAATGGTACGATTACAGATCCG  
23FTW TATTTCCACACCATCGTAACTGAAAAGAAATCAATTGAGAATGGTACGATTACAGATCCG  
\*\* \*\*\* \* \*\* \*\*\*\*\* \* \*\* \*\*\*\*\* \* \*\* \*\*\*\*\* \* \*\* \*\*\*\*\* \*

14CSR ATGGGTGAACTAATTGATTTCCAATTGGGAGCAGATGGAAGGTTTGATCCAGCGGATTAC  
670 ATGGGTGAACTAATTGATTTCCAATTGGGAGCAGATGGAAGGTTTGATCCAGCGGATTAC  
6BF ATGGGTGAACTAATTGATTTCCAATTGGGAGCAGATGGAAGGTTTGATCCAGCGGATTAC  
6BSP ATGGGTGAACTAATTGATTTCCAATTGGGAGCAGATGGAAGGTTTGATCCAGCGGATTAC  
19AH ATGGGTGAACTAATTGATTTCCAATTGGGAGCAGATGGAAGGTTTGATCCAGCGGATTAC  
23FPO ATGGGTGAACTAATTGATTTCCAATTGGGAGCAGATGGAAGGTTTGATCCAGCGGATTAC  
19FTW ATGGGTGAGTTAATTGATTTGCAATTGGGCACAGATGGAAGATTTGATCCAGCAGATTAC  
9VSP ATGGGTGAGTTAATTGATTTGCAATTGGGCACAGATGGAAGATTTGATCCAGCAGATTAC  
TIGR4 ATGGGTGAGTTAATTGATTTGCAATTGGGCACAGATGGAAGATTTGATCCAGCAGATTAC  
23FTW ATGGGTGAGTTAATTGATTTGCAATTGGGCACAGATGGAAGATTTGATCCAGCAGATTAC  
\*\*\*\*\*

14CSR ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA  
670 ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA  
6BF ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA  
6BSP ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA  
19AH ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA  
23FPO ACTTTAACTGCAAACGATGGTAGTTCGTTGGTGAATAATGTCCCTACTGGGGGACCACAA  
19FTW ACTTTAACTGCAAACGATGGTAGTCGCTTGGAGAATGGACAAGCTGTAGGTGGTCCACAA  
9VSP ACTTTAACTGCAAACGATGGTAGTCGCTTGGAGAATGGACAAGCTGTAGGTGGTCCACAA  
TIGR4 ACTTTAACTGCAAACGATGGTAGTCGCTTGGAGAATGGACAAGCTGTAGGTGGTCCACAA  
23FTW ACTTTAACTGCAAACGATGGTAGTCGCTTGGAGAATGGACAAGCTGTAGGTGGTCCACAA  
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Figure 196N

14CSR AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT  
670 AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT  
6BF AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT  
6BSP AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT  
19AH AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT  
23FPO AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT  
19FTW AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT  
9VSP AATGATGGTGGCTTGCTAAAAAATGCAAAAGTGTTCTATGATACGACTGAGAAAAGGATT  
TIGR4 AATGATGGTGGTTTGTAAAAAATGCAAAAGTGCTCTATGATACGACTGAGAAAAGGATT  
23FTW AATGATGGTGGTTTGTAAAAAATGCAAAAGTGCTCTATGATACGACTGAGAAAAGGATT  
\*\*\*\*\* \*\*

14CSR CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC  
670 CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC  
6BF CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC  
6BSP CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC  
19AH CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC  
23FPO CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC  
19FTW CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC  
9VSP CGTGTAACAGGTTTGTACCTTGAACGGGTGAAAAAGTTACATTGACTTATAATGTTTCGC  
TIGR4 CGTGTAACAGGTTCTGTACCTTGAACGGATGAAAAAGTTACGTTGACCTACAATGTTTCGT  
23FTW CGTGTAACAGGTTCTGTACCTTGAACGGATGAAAAAGTTACGTTGACCTACAATGTTTCGT  
\*\*\*\*\* \*\*

14CSR TTGAATGACCAATTTGTAAGCAATAAATTCCTATGACACGAATGGTCGAACAACCCTACAC  
670 TTGAATGACCAATTTGTAAGCAATAAATTCCTATGACACGAATGGTCGAACAACCCTACAC  
6BF TTGAATGACCAATTTGTAAGCAATAAATTCCTATGACACGAATGGTCGAACAACCCTACAC  
6BSP TTGAATGACCAATTTGTAAGCAATAAATTCCTATGACACGAATGGTCGAACAACCCTACAC  
19AH TTGAATGACCAATTTGTAAGCAATAAATTCCTATGACACGAATGGTCGAACAACCCTACAC  
23FPO TTGAATGACCAATTTGTAAGCAATAAATTCCTATGACACGAATGGTCGAACAACCCTACAC  
19FTW TTGAATGACCAATTTGTAAGCAATAAATTCCTATGACACGAATGGTCGAACAACCCTACAC  
9VSP TTGAATGACCAATTTGTAAGCAATAAATTCCTATGACACGAATGGTCGAACAACCCTACAC  
TIGR4 TTGAATGATGAGTTTGTAGCAATAAATTTTATGATACCAATGGTCGAACAACCTTACAT  
23FTW TTGAATGATGAGTTTGTAGCAATAAATTTTATGATACCAATGGTCGAACAACCTTACAT  
\*\*\*\*\* \*

14CSR CCTAAGGAAGTAGAAAAGAACACAGTGCGCGACTTCCCGATTCCCTAAGATTCGTGATGTA  
670 CCTAAGGAAGTAGAAAAGAACACAGTGCGCGACTTCCCGATTCCCTAAGATTCGTGATGTA  
6BF CCTAAGGAAGTAGAAAAGAACACAGTGCGCGACTTCCCGATTCCCTAAGATTCGTGATGTA  
6BSP CCTAAGGAAGTAGAAAAGAACACAGTGCGCGACTTCCCGATTCCCTAAGATTCGTGATGTA  
19AH CCTAAGGAAGTAGAAAAGAACACAGTGCGCGACTTCCCGATTCCCTAAGATTCGTGATGTA  
23FPO CCTAAGGAAGTAGAAAAGAACACAGTGCGCGACTTCCCGATTCCCTAAGATTCGTGATGTA  
19FTW CCTAAGGAAGTAGAAAAGAACACAGTGCGCGACTTCCCGATTCCCTAAGATTCGTGATGTG  
9VSP CCTAAGGAAGTAGAAAAGAACACAGTGCGCGACTTCCCGATTCCCTAAGATTCGTGATGTG  
TIGR4 CCTAAGGAAGTAGAACAGAACACAGTGCGCGACTTCCCGATTCCCTAAGATTCGTGATGTG  
23FTW CCTAAGGAAGTAGAACAGAACACAGTGCGCGACTTCCCGATTCCCTAAGATTCGTGATGTG  
\*\*\*\*\*

14CSR CGAAAGTATCCAGAAATCACAATTCACAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT  
670 CGAAAGTATCCAGAAATCACAATTCACAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT  
6BF CGAAAGTATCCAGAAATCACAATTCACAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT  
6BSP CGAAAGTATCCAGAAATCACAATTCACAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT  
19AH CGAAAGTATCCAGAAATCACAATTCACAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT  
23FPO CGAAAGTATCCAGAAATCACAATTCACAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT  
19FTW CGAAAATATCCAGCAATTACGATTGCAAAAGAGAAAAAACTTGGTGAAATTGAGTTTATT  
9VSP CGAAAATATCCAGCAATTACGATTGCAAAAGAGAAAAAACTTGGTGACATTGAGTTTATT  
TIGR4 CGGAAGTATCCAGAAATCACAATTCACAAAAGAGAAAAAACTTGGTGACATTGAGTTTATT  
23FTW CGGAAGTATCCAGAAATCACAATTCACAAAAGAGAAAAAACTTGGTGACATTGAGTTTATT  
\*\* \*\*

Figure 1960



PCT/US05/27239 408/487

14CSR AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA  
670 AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA  
6BF AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA  
6BSP AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA  
19AH AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA  
23FPO AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA  
19FTW AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA  
9VSP AAGATCAATAAGAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA  
TIGR4 AAGGTCAATAAAAAATGATAAAAAACCACTGAGAGGTGCGGTCTTTAGTCTTCAAAAACAA  
23FTW AAGGTCAATAAAAAATGATAAAAAACCACTGAGAGATGCGGTCTTTAGTCTTCAAAAACAA  
\*\*\* \*\*\*\*\*

14CSR CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG  
670 CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG  
6BF CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG  
6BSP CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG  
19AH CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG  
23FPO CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG  
19FTW CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG  
9VSP CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG  
TIGR4 CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG  
23FTW CATCCGGATTATCCAGATATTTATGGAGCTATTGATCAAAATGGCACTTATCAAAATGTG  
\*\*\*\*\*

14CSR AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA  
670 AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA  
6BF AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA  
6BSP AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA  
19AH AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA  
23FPO AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA  
19FTW AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA  
9VSP AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA  
TIGR4 AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA  
23FTW AGAACAGGTGAAGATGGTAAGTTGACCTTTAAAAATCTGTCAGATGGGAAATATCGATTA  
\*\*\*\*\*

14CSR TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC  
670 TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC  
6BF TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC  
6BSP TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC  
19AH TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC  
23FPO TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC  
19FTW TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC  
9VSP TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC  
TIGR4 TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC  
23FTW TTTGAAAATTCTGAACCAGCTGGTTATAAACCCGTTCAAATAAGCCTATCGTTGCCTTC  
\*\*\*\*\*

14CSR CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATAACCAGCG  
670 CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATAACCAGCG  
6BF CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATAACCAGCG  
6BSP CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATAACCAGCG  
19AH CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATAACCAGCG  
23FPO CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATAACCAGCG  
19FTW CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATAACCAGCG  
9VSP CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATAACCAGCG  
TIGR4 CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATAACCAGCG  
23FTW CAAATAGTAAATGGAGAAGTCAGAGATGTGACTTCAATCGTTCCACAAGATATAACCAGCG  
\*\*\*\*\*

Figure 196P



PCT/US05/27239 409/487

14CSR GGTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCCAAAAAGA  
670 GGTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCCAAAAAGA  
6BF GGTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCCAAAAAGA  
6BSP GGTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCCAAAAAGA  
19AH GGTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCCAAAAAGA  
23FPO GGTACGAGTTTACGAATGATAAGCACTATATCACAAATGAGCCAATTCTCCAAAAAGA  
19FTW GGTACGAGTTTACGAATGATAAGCACTATATTACCAATGAACCTATTCTCCAAAGAGA  
9VSP GGTACGAGTTTACGAATGATAAGCACTATATTACCAATGAACCTATTCTCCAAAGAGA  
TIGR4 GGTACGAGTTTACGAATGATAAGCACTATATTACCAATGAACCTATTCTCCAAAGAGA  
23FTW GGTACGAGTTTACGAATGATAAGCACTATATTACCAATGAACCTATTCTCCAAAGAGA  
\*\*\*\*\* \*\* \*\*\*\*\* \*\* \*\*\*\*\* \*\*

14CSR GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG  
670 GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG  
6BF GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG  
6BSP GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG  
19AH GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG  
23FPO GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG  
19FTW GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG  
9VSP GAATATCCTCGAACTGGTGGTATCGGAATGTTGCTATTCTATCTGATAGGTTGCATGATG  
TIGR4 GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG  
23FTW GAATATCCTCGAACTGGTGGTATCGGAATGTTGCCATTCTATCTGATAGGTTGCATGATG  
\*\*\*\*\* \*\*\*\*\*

14CSR ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAGCAATGAGAAATGAT  
670 ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAGCAATGAGAAATGAT  
6BF ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAGCAATGAGAAATGAT  
6BSP ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAGCAATGAGAAATGAT  
19AH ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAGCAATGAGAAATGAT  
23FPO ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAGCAATGAGAAATGAT  
19FTW ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAG-----AAATGAT  
9VSP ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAG-----AAATGAT  
TIGR4 ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAG-----AAATGAT  
23FTW ATGGGAGGAGTTCTATTATACACACGGAACATCCGTAAAGTGTAG-----AAATGAT  
\*\*\*\*\* \*\*\*\*\*

14CSR AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA  
670 AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA  
6BF AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA  
6BSP AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA  
19AH AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA  
23FPO AATATCGATACTCTGAGCGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA  
19FTW AATATCTATGTTCTGAACAATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA  
9VSP AATATCTATGTTCTGAACGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA  
TIGR4 AATATCTATGTTCTGAACGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA  
23FTW AATATCTATGTTCTGAACGATACTTTTAAGAAGTAGCACTCAAGAAGAGATTTAAGTTTA  
\*\*\*\*\* \*\* \*\*\*\*\* \* \*\*\*\*\*

14CSR CTTGGTGAAAACAGTTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA  
670 CTTGGTGAAAACAGTTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA  
6BF CTTGGTGAAAACAGTTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA  
6BSP CTTGGTGAAAACAGTTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA  
19AH CTTGGTGAAAACAGTTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA  
23FPO CTTGGTGAAAACAGTTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA  
19FTW CTTGGTGAAACCAGTTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA  
9VSP CTTGGTGAAACCAGTTTTCTTCGCCAAGTAAACCACCATTGAAAGGGGAGATGTTTTCGA  
TIGR4 CTTGGTGAAACCTGTTTTATTCGT-AAGTAAACTATCATTGAAAGGGGAGATGTTTTCGA  
23FTW CTTGGTGAAACCTGTTTTATTCGT-AAGTAAACTATCATTGAAAGGGGAGATGTTTTCGA  
\*\*\*\*\* \* \*\*\*\*\* \*\*\*\*\* \* \*\*\*\*\*

Figure 196Q

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14CSR AAACCTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT  
670 AAACCTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT  
6BF AAACCTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT  
6BSP AAACCTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT  
19AH AAACCTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT  
23FPO AAACCTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT  
19FTW AAACCTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT  
9VSP AAACCTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT  
TIGR4 AAACCTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT  
23FTW AAACCTTGCACAGAAAAAAGGATTATTATTGTCATGTGTAATTCATTACATTGCTCACAGT  
\*\*\*\*\*

14CSR TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT  
670 TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT  
6BF TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT  
6BSP TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT  
19AH TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT  
23FPO TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT  
19FTW TGATTTTAAGAGATA--AATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT  
9VSP TGATTTTAAGAGATA--AATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT  
TIGR4 TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT  
23FTW TGATTTTAAGAGATATGAATAAGGAGAAATCATGAAATCAATCAACAAATTTTAAACAAT  
\*\*\*\*\*

14CSR GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGCGGC  
670 GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGCGGC  
6BF GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGCGGC  
6BSP GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGCGGC  
19AH GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGCGGC  
23FPO GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGCGGC  
19FTW GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGCGGC  
9VSP GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGCGGC  
TIGR4 GCTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTTTAGCTGCAACAGTTTTTGCGGC  
23FTW ACTTGCTGCCTTATTACTGACAGCGAGTAGCCTGTTCTCAGCTGCAACAGTTTTTGCGGC  
\*\*\*\*\*

14CSR GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACCTTTAACAATCCATAAGTTACT  
670 GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACCTTTAACAATCCATAAGTTACT  
6BF GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACCTTTAACAATCCATAAGTTACT  
6BSP GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACCTTTAACAATCCATAAGTTACT  
19AH GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACCTTTAACAATCCATAAGTTACT  
23FPO GGACAATGTTAGTACAGCACCAGATGCTGTTACTAAAACCTTTAACAATCCATAAGTTACT  
19FTW TGG-GACGACA--ACAACATCTGTTACCGTTCATAAACTATTGGCAACAGATGGGGATAT  
9VSP TGG-GACGACA--ACAACATCTGTTACCGTTCATAAACTATTGGCAACAGATGGGGATAT  
TIGR4 TGG-GACGACA--ACAACATCTGTTACCGTTCATAAACTATTGGCAACAGATGGGGATAT  
23FTW GGA-ACAAAA--ACTAAGACACTTACAGTTCATAAATTATTGATGACAGATCAAGAGCT  
\* \* \* \* \*

14CSR GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA-AGGATATGATG  
670 GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA-AGGATATGATG  
6BF GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA-AGGATATGATG  
6BSP GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA-AGGATATGATG  
19AH GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA-AGGATATGATG  
23FPO GCTCTCA---GAAGATGATTTAAAGACTTGGGATACAAACGGTCCTAA-AGGATATGATG  
19FTW GGATAAAATTGCAAAATGAGTTAGAAACAGGTAAGTATGCTGGTAATAA-AGTGGGTGTTT  
9VSP GGATAAAATTGCAAAATGAGTTAGAAACAGGTAAGTATGCTGGTAATAA-AGTGGGTGTTT  
TIGR4 GGATAAAATTGCAAAATGAGTTAGAAACAGGTAAGTATGCTGGTAATAA-AGTGGGTGTTT  
23FTW TGAC-----GCTTGGAAATCTGATGCGATTACTACTGCAGGTTATGACGGTTCGCAAAA  
\* \* \* \* \*

Figure 196R



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14CSR GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT  
670 GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT  
6BF GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT  
6BSP GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT  
19AH GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT  
23FPO GAACTCAATCTAGTTTAAAAGATTTAACTGGAGTTGTAGCTG----AGGAAATTCCAAAT  
19FTW TACCTGCA---AATGCAAAAGAAATTGCCGGTGTATGTTCTGTTTGGACAAATACTAATA  
9VSP TACCTGCA---AATGCAAAAGAAATTGCCGGTGTATGTTCTGTTTGGACAAATACTAATA  
TIGR4 TACCTGCA---AATGCAAAAGAAATTGCCGGTGTATGTTCTGTTTGGACAAATACTAATA  
23FTW T-TTTGAA---CAGTTCAAACAACCTTCAAGGTGTTCCACAAG---GAGTAACCGAAATCT  
\* \* \* \* \*

14CSR GTATACTT-----TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA  
670 GTATACTT-----TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA  
6BF GTATACTT-----TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA  
6BSP GTATACTT-----TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA  
19AH GTATACTT-----TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA  
23FPO GTATACTT-----TGAATTACAAAAGTATA-ATTTGACTGATGGT--AAGGAAAAAGA  
19FTW ATGAAATTATTGATGAAAATGGCCAACTCTAGGAGTGAATATTGATCCACAACATTTA  
9VSP ATGAAATTATTGATGAAAATGGCCAACTCTAGGAGTGAATATTGATCCACAACATTTA  
TIGR4 ATGAAATTATTGATGAAAATGGCCAACTCTAGGAGTGAATATTGATCCACAACATTTA  
23FTW CTGGTGTTC--ATTGAGTTACAGAGTTATACGGGTCTCAAGGA--AAAGAACAAGAA  
\* \* \* \* \*

14CSR AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACCTAAAGATGG  
670 AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACCTAAAGATGG  
6BF AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACCTAAAGATGG  
6BSP AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACCTAAAGATGG  
19AH AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACCTAAAGATGG  
23FPO AAATCTTAAAGATGATAGTAAATGGACAACAGTTCATGGTGGTTTGACAACCTAAAGATGG  
19FTW AACTCTCAGGGGCAATGCCGGC--AACTGCAATGAAAAAATTAACAGAAGCTGAA---GG  
9VSP AACTCTCAGGGGCAATGCCGGC--AACTGCAATGAAAAAATTAACAGAAGCTGAA---GG  
TIGR4 AACTCTCAGGGGCAATGCCGGC--AACTGCAATGAAAAAATTAACAGAAGCTGAA---GG  
23FTW AA-TTTAACGAATGATGCGGTTTGGACTGCGGTTAATAAAGGTGTGACGACTGAAACAGG  
\*\* \* \* \* \* \*\* \* \* \* \*

14CSR ACTTAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC  
670 ACTTAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC  
6BF ACTTAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC  
6BSP ACTTAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC  
19AH ACTTAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC  
23FPO ACTTAAAATTGAAACCAGTACTCTTAAAGGTGT---GTATCGTATTCGTGAGGATAGAAC  
19FTW AGCTAAATTTAACACGGCAAAATTTACCAGCTGCTAAGTATAAAATTTATGAAATTCACAG  
9VSP AGCTAAATTTAACACGGCAAAATTTACCAGCTGCTAAGTATAAAATTTATGAAATTCACAG  
TIGR4 AGCTAAATTTAACACGGCAAAATTTACCAGCTGCTAAGTATAAAATTTATGAAATTCACAG  
23FTW TGTAAATTTGATACTGAAGTTTACAAGGGAC---ATATCGTCTTGTGCAAGTACGTAA  
\*\*\*\*\* \* \* \* \* \* \* \* \*

14CSR AAAGACTACCTATGTTGGTCCTAATGGGCAAGTATTAACAGGTTCAAAGCCGTACCTGC  
670 AAAGACTACCTATGTTGGTCCTAATGGGCAAGTATTAACAGGTTCAAAGCCGTACCTGC  
6BF AAAGACTACCTATGTTGGTCCTAATGGGCAAGTATTAACAGGTTCAAAGCCGTACCTGC  
6BSP AAAGACTACCTATGTTGGTCCTAATGGGCAAGTATTAACAGGTTCAAAGCCGTACCTGC  
19AH AAAGACTACCTATGTTGGTCCTAATGGGCAAGTATTAACAGGTTCAAAGCCGTACCTGC  
23FPO AAAGACTACCTATGTTGGTCCTAATGGGCAAGTATTAACAGGTTCAAAGCCGTACCTGC  
19FTW TTTATCAACTTATGTCGGTGAAGATGGAGCAACCTTAACAGGTTCTAAAGCAGTTCCAAT  
9VSP TTTATCAACTTATGTCGGTGAAGATGGAGCAACCTTAACAGGTTCTAAAGCAGTTCCAAT  
TIGR4 TTTATCAACTTATGTCGGTGAAGATGGAGCAACCTTAACAGGTTCTAAAGCAGTTCCAAT  
23FTW AGAATCGACTTATGTCGGTCCAAATGGTAAAGTTTAAACAGGTATGAAAGCTGTTCTCTGC  
\* \* \* \* \* \* \* \* \* \* \* \* \* \* \*

Figure 196S



14CSR	TCTTGTA	ACTCTT	CCACTT	GTGTTA	ACAATA	ATATGG	TACAGT	AATTGAT	GCACAT	GTTTTCC	CC
670	TCTTGTA	ACTCTT	CCACTT	GTGTTA	ACAATA	ATATGG	TACAGT	AATTGAT	GCACAT	GTTTTCC	CC
6BF	TCTTGTA	ACTCTT	CCACTT	GTGTTA	ACAATA	ATATGG	TACAGT	AATTGAT	GCACAT	GTTTTCC	CC
6BSP	TCTTGTA	ACTCTT	CCACTT	GTGTTA	ACAATA	ATATGG	TACAGT	AATTGAT	GCACAT	GTTTTCC	CC
19AH	TCTTGTA	ACTCTT	CCACTT	GTGTTA	ACAATA	ATATGG	TACAGT	AATTGAT	GCACAT	GTTTTCC	CC
23FPO	TCTTGTA	ACTCTT	CCACTT	GTGTTA	ACAATA	ATATGG	TACAGT	AATTGAT	GCACAT	GTTTTCC	CC
19FTW	TGAAATT	GAATTACC	ATT-----	GAACGAT	GTTGTGGA	---	TGCGCAT	GTGTATCC			
9VSP	TGAAATT	GAATTACC	ATT-----	GAACGAT	GTTGTGGA	---	TGCGCAT	GTGTATCC			
TIGR4	TGAAATT	GAATTACC	ATT-----	GAACGAT	GTTGTGGA	---	TGCGCAT	GTGTATCC			
23FTW	TTTAATT	ACTCTG	CCGCTT	GTAAAC	CAAAAT	GGTGT	TGTAGAAA	ATGCACAT	GTCTATCC		
	*	*	*	*	*	*	*	*	*	*	*
14CSR	TAAAAAT	TCATATA	AATAAA	ACCAGT	TGTAGATA	AAAAGA	ATTGCTGATA	CTTTGAATT	TATAA		
670	TAAAAAT	TCATATA	AATAAA	ACCAGT	TGTAGATA	AAAAGA	ATTGCTGATA	CTTTGAATT	TATAA		
6BF	TAAAAAT	TCATATA	AATAAA	ACCAGT	TGTAGATA	AAAAGA	ATTGCTGATA	CTTTGAATT	TATAA		
6BSP	TAAAAAT	TCATATA	AATAAA	ACCAGT	TGTAGATA	AAAAGA	ATTGCTGATA	CTTTGAATT	TATAA		
19AH	TAAAAAT	TCATATA	AATAAA	ACCAGT	TGTAGATA	AAAAGA	ATTGCTGATA	CTTTGAATT	TATAA		
23FPO	TAAAAAT	TCATATA	AATAAA	ACCAGT	TGTAGATA	AAAAGA	ATTGCTGATA	CTTTGAATT	TATAA		
19FTW	AAAAAAT	ACAGAAG	CAAAGC	CAAAAAT	TGATAA	AGATTT	CAAAGG	TAAAGCAA	ATCCAGA		
9VSP	AAAAAAT	ACAGAAG	CAAAGC	CAAAAAT	TGATAA	AGATTT	CAAAGG	TAAAGCAA	ATCCAGA		
TIGR4	AAAAAAT	ACAGAAG	CAAAGC	CAAAAAT	TGATAA	AGATTT	CAAAGG	TAAAGCAA	ATCCAGA		
23FTW	AAAGAAT	TCTGAAG	ACAAAC	CTACAG	CAACGAA	ACATTT	TGATACT	GCAGCAG	GTTTCGT		
	**	***	*	*	**	*	***	*	*	*	*
14CSR	CGATCAA	-----	AATGGT	CTGTCT	ATCGGT	ACTAAA	ATCCCAT	ATGTTGT	----	TA	
670	CGATCAA	-----	AATGGT	CTGTCT	ATCGGT	ACTAAA	ATCCCAT	ATGTTGT	----	TA	
6BF	CGATCAA	-----	AATGGT	CTGTCT	ATCGGT	ACTAAA	ATCCCAT	ATGTTGT	----	TA	
6BSP	CGATCAA	-----	AATGGT	CTGTCT	ATCGGT	ACTAAA	ATCCCAT	ATGTTGT	----	TA	
19AH	CGATCAA	-----	AATGGT	CTGTCT	ATCGGT	ACTAAA	ATCCCAT	ATGTTGT	----	TA	
23FPO	CGATCAA	-----	AATGGT	CTGTCT	ATCGGT	ACTAAA	ATCCCAT	ATGTTGT	----	TA	
19FTW	TACACC	ACGTGT	AGATAA	AGATAC	ACCTGT	GAACC	ACCAAG	TGGAGAT	GTTGTAG	AGTA	
9VSP	TACACC	ACGTGT	AGATAA	AGATAC	ACCTGT	GAACC	ACCAAG	TGGAGAT	GTTGTAG	AGTA	
TIGR4	TACACC	ACGTGT	AGATAA	AGATAC	ACCTGT	GAACC	ACCAAG	TGGAGAT	GTTGTAG	AGTA	
23FTW	AGATCC	AGGTG---	AAAAGG	TTAGCA	ATTGGC	ACTAAG	GTACCG	TATATT	GT----	TA	
	*	*	*	*	*	*	*	*	*	*	*
14CSR	ATACAACA	AATTC	CAAGTA	AATGCA	ACATT-----	TGCAACT	TCATTTT	GGTCAGAT	G		
670	ATACAACA	AATTC	CAAGTA	AATGCA	ACATT-----	TGCAACT	TCATTTT	GGTCAGAT	G		
6BF	ATACAACA	AATTC	CAAGTA	AATGCA	ACATT-----	TGCAACT	TCATTTT	GGTCAGAT	G		
6BSP	ATACAACA	AATTC	CAAGTA	AATGCA	ACATT-----	TGCAACT	TCATTTT	GGTCAGAT	G		
19AH	ATACAACA	AATTC	CAAGTA	AATGCA	ACATT-----	TGCAACT	TCATTTT	GGTCAGAT	G		
23FPO	ATACAACA	AATTC	CAAGTA	AATGCA	ACATT-----	TGCAACT	TCATTTT	GGTCAGAT	G		
19FTW	CGA-AAT	TGTTAC	AAAAAT	CCAGC	ACTTGCTA	AATTAT	TGCAAC	AGCAAAC	TGGAGCG	GATA	
9VSP	CGA-AAT	TGTTAC	AAAAAT	CCAGC	ACTTGCTA	AATTAT	TGCAAC	AGCAAAC	TGGAGCG	GATA	
TIGR4	CGA-AAT	TGTTAC	AAAAAT	CCAGC	ACTTGCTA	AATTAT	TGCAAC	AGCAAAC	TGGAGCG	GATA	
23FTW	CAACAAC	TATTC	CGAAAA	ACTCAAC	TCT-----	TGCAAC	AGCTTT	TCTGGT	CAGATG		
	*	*	*	*	*	*	*	*	*	*	*
14CSR	AAATGAC	AGAAGG	TCTAACT	TATAAT	GAAGA-GTAACA	AA--TT	ACTTTGA	ATAATGT	AG		
670	AAATGAC										

Figure 196T

Figure 196U



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14CSR	GGGTGAAAGCGACTGTTCAACTTGTAATGCCAAGACTGGTGAGAAAAGTCGGTGCTCC--
670	GGGTGAAAGCGACTGTTCAACTTGTAATGCCAAGACTGGTGAGAAAAGTCGGTGCTCC--
6BF	GGGTGAAAGCGACTGTTCAACTTGTAATGCCAAGACTGGTGAGAAAAGTCGGTGCTCC--
6BSP	GGGTGAAAGCGACTGTTCAACTTGTAATGCCAAGACTGGTGAGAAAAGTCGGTGCTCC--
19AH	GGGTGAAAGCGACTGTTCAACTTGTAATGCCAAGACTGGTGAGAAAAGTCGGTGCTCC--
23FPO	GGGTGAAAGCGACTGTTCAACTTGTAATGCCAAGACTGGTGAGAAAAGTCGGTGCTCC--
19FTW	GAGCTGAAGCAACGTTTCGATTTGGTTAATGCTCAGACTGGTAAAGTTGTACAAAC-----
9VSP	GAGCTGAAGCAACGTTTCGATTTGGTTAATGCTCAGACTGGTAAAGTTGTACAAAC-----
TIGR4	GAGCTGAAGCAACGTTTCGATTTGGTTAATGCTCAGACTGGTAAAGTTGTACAAAC-----
23FTW	GTGTAGAAGTAACCTTTTGATTTGGTAAATGCTCAGACAGGTGAGGTCGTTAAAGTACCTG
	* *      ***    *   *   *   *   *   *   *   *   *   *   *

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14CSR      -----TGTAGAACTTTC--AGAAAATAATTGGACATATACTTGGAGTGGTC
670        -----TGTAGAACTTTC--AGAAAATAATTGGACATATACTTGGAGTGGTC
6BF        -----TGTAGAACTTTC--AGAAAATAATTGGACATATACTTGGAGTGGTC
6BSP       -----TGTAGAACTTTC--AGAAAATAATTGGACATATACTTGGAGTGGTC
19AH       -----TGTAGAACTTTC--AGAAAATAATTGGACATATACTTGGAGTGGTC
23FPO      -----TGTAGAACTTTC--AGAAAATAATTGGACATATACTTGGAGTGGTC
19FTW      -----TGTAAC TTTGAC--AACAGACAAAATAACAGTTACTGTTAACGGAT
9VSP       -----TGTAAC TTTGAC--AACAGACAAAATAACAGTTACTGTTAACGGAT
TIGR4      -----TGTAAC TTTGAC--AACAGACAAAATAACAGTTACTGTTAACGGAT
23FTW      GACATGAAACAGGTATTGTATTGAATCAACAAATAATTGGACATT TACTGCTACAGGTC
              *  *      *      *  *  *  *  *  *  *  *  *  *  *

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14CSR	TAGATAATTCTATTGAATACAAAGTTGAAGAA--GAATAT-AATGGATACTCAGCTGAAT
670	TAGATAATTCTATTGAATACAAAGTTGAAGAA--GAATAT-AATGGATACTCAGCTGAAT
6BF	TAGATAATTCTATTGAATACAAAGTTGAAGAA--GAATAT-AATGGATACTCAGCTGAAT
6BSP	TAGATAATTCTATTGAATACAAAGTTGAAGAA--GAATAT-AATGGATACTCAGCTGAAT
19AH	TAGATAATTCTATTGAATACAAAGTTGAAGAA--GAATAT-AATGGATACTCAGCTGAAT
23FPO	TAGATAATTCTATTGAATACAAAGTTGAAGAA--GAATAT-AATGGATACTCAGCTGAAT
19FTW	TGGATAAAAATACAGAATATAAAATTCGTTGAACGTAGTATAAAAGGGTATTTCAGCAGATT
9VSP	TGGATAAAAATACAGAATATAAAATTCGTTGAACGTAGTATAAAAGGGTATTTCAGCAGATT
TIGR4	TGGATAAAAATACAGAATATAAAATTCGTTGAACGTAGTATAAAAGGGTATTTCAGCAGATT
23FTW	TTGATAATAATACAGAATATAAAATTTGTTGAACGGACAATTAAGGGATATTCTGCAGATT
	* * * * *

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14CSR      ACACAGTAGAGAGCAAA---GGGAAGTTGGGGGTAAAAAACTGGAAAGATAATAACCCAG
670        ACACAGTAGAGAGCAAA---GGGAAGTTGGGGGTAAAAAACTGGAAAGATAATAACCCAG
6BF        ACACAGTAGAGAGCAAA---GGGAAGTTGGGGGTAAAAAACTGGAAAGATAATAACCCAG
6BSP       ACACAGTAGAGAGCAAA---GGGAAGTTGGGGGTAAAAAACTGGAAAGATAATAACCCAG
19AH       ACACAGTAGAGAGCAAA---GGGAAGTTGGGGGTAAAAAACTGGAAAGATAATAACCCAG
23FPO      ACACAGTAGAGAGCAAA---GGGAAGTTGGGGGTAAAAAACTGGAAAGATAATAACCCAG
19FTW      ATCAAGAAATCACTACAGCTGGAGAAATTGCTGTCAAGAACTGGAAAGACGAAAATCCAA
9VSP       ATCAAGAAATCACTACAGCTGGAGAAATTGCTGTCAAGAACTGGAAAGACGAAAATCCAA
TIGR4      ATCAAGAAATCACTACAGCTGGAGAAATTGCTGTCAAGAACTGGAAAGACGAAAATCCAA
23FTW      ACCAAACAATTACTGAAACAGGAAAAATTGCTGTTAAAACTGGAAAGATGAAAATCCAA
          *   *   *   *   *   *   *   *   *   *   *   *   *   *   *

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14CSR	CTCCAATCAATC-TGAAGAACCACGTGTAAAAACATACGGTAAAAAGTTTGTCAAAGTAG
670	CTCCAATCAATCCTGAAGAACCACGTGTAAAAACATACGGTAAAAAGTTTGTCAAAGTAG
6BF	CTCCAATCAATCCTGAAGAACCACGTGTAAAAACATACGGTAAAAAGTTTGTCAAAGTAG
6BSP	CTCCAATCAATCCTGAAGAACCACGTGTAAAAACATACGGTAAAAAGTTTGTCAAAGTAG
19AH	CTCCAATCAATCCTGAAGAACCACGTGTAAAAACATACGGTAAAAAGTTTGTCAAAGTAG
23FPO	CTCCAATCAATCTTGAAGAACCACGTGTAAAAACATACGGTAAAAAGTTTGTCAAAGTAG
19FTW	AACCACTTGATCCAACAGAGCCAAAAGTTGTTACATATGGTAAAAAGTTTGTCAAAGTTA
9VSP	AACCACTTGATCCAACAGAGCCAAAAGTTGTTACATATGGTAAAAAGTTTGTCAAAGTTA
TIGR4	AACCACTTGATCCAACAGAGCCAAAAGTTGTTACATATGGTAAAAAGTTTGTCAAAGTTA
23FTW	AACCAATAAATCCTGAAGAAGCCACGTGTAAAAACATATGGTAAAAAATTCGTTAAGGTTG
	*** * *** *** ** ***** ** ** *

Figure 196V



14CSR	ACCAAAAAGATACTCGTCTAGAAAAATGCGCAGTTCGTTGTTAAAAAAGCAGATAGC---
670	ACCAAAAAGATACTCGTCTAGAAAAATGCGCAGTTCGTTGTTAAAAAAGCAGATAGC---
6BF	ACCAAAAAGATACTCGTCTAGAAAAATGCGCAGTTCGTTGTTAAAAAAGCAGATAGC---
6BSP	ACCAAAAAGATACTCGTCTAGAAAAATGCGCAGTTCGTTGTTAAAAAAGCAGATAGC---
19AH	ACCAAAAAGATACTCGTCTAGAAAAATGCGCAGTTCGTTGTTAAAAAAGCAGATAGC---
23FPO	ACCAAAAAGATACTCGTCTAGAAAAATGCGCAGTTCGTTGTTAAAAAAGCAGATAGC---
19FTW	ATGATAAAGATAATCGTTTAGCTGGGGCAGAATTTGTAATTGCAAATGCTGATAATGCTG
9VSP	ATGATAAAGATAATCGTTTAGCTGGGGCAGAATTTGTAATTGCAAATGCTGATAATGCTG
TIGR4	ATGATAAAGATAATCGTTTAGCTGGGGCAGAATTTGTAATTGCAAATGCTGATAATGCTG
23FTW	ACCAAAAAGACGAACGCTTAAAGAAGCACAAATTCGTTGTGAAGAATG--AGCAA----G
	* * * * * * * * * * * * * * *
14CSR	ATAAATATATTGCCTTTAAGTCAACTGCACAACAAGCT--GCAGATGAAAAAGCAGCAGC
670	ATAAATATATTGCCTTTAAGTCAACTGCACAACAAGCT--GCAGATGAAAAAGCAGCAGC
6BF	ATAAATATATTGCCTTTAAGTCAACTGCACAACAAGCT--GCAGATGAAAAAGCAGCAGC
6BSP	ATAAATATATTGCCTTTAAGTCAACTGCACAACAAGCT--GCAGATGAAAAAGCAGCAGC
19AH	ATAAATATATTGCCTTTAAGTCAACTGCACAACAAGCT--GCAGATGAAAAAGCAGCAGC
23FPO	ATAAATATATTGCCTTTAAGTCAACTGCACAACAAGCT--GCAGATGAAAAAGCAGCAGC
19FTW	GTCAATATTTAGCACGTAAAGCAG--ATAAAGTGAGTCAAGAAGAGAAGCAGTTGGTTGT
9VSP	GTCAATATTTAGCACGTAAAGCAG--ATAAAGTGAGTCAAGAAGAGAAGCAGTTGGTTGT
TIGR4	GTCAATATTTAGCACGTAAAGCAG--ATAAAGTGAGTCAAGAAGAGAAGCAGTTGGTTGT
23FTW	GGAAATATCTTGCACTCAAATCTGCAGCACACAAGCT--GTAAATGAGAAAGCTGCCGC
	* * * * * * * * * * * * * * *
14CSR	AACTGCAAAACAAAAAATTGGATGCAGCGGTAGCAGCTTACA---CAAATGCTGCAGATAA
670	AACTGCAAAACAAAAAATTGGATGCAGCGGTAGCAGCTTACA---CAAATGCTGCAGATAA
6BF	AACTGCAAAACAAAAAATTGGATGCAGCGGTAGCAGCTTACA---CAAATGCTGCAGATAA
6BSP	AACTGCAAAACAAAAAATTGGATGCAGCGGTAGCAGCTTACA---CAAATGCTGCAGATAA
19AH	AACTGCAAAACAAAAAATTGGATGCAGCGGTAGCAGCTTACA---CAAATGCTGCAGATAA
23FPO	AACTGCAAAACAAAAAATTGGATGCAGCGGTAGCAGCTTACA---CAAATGCTGCAGATAA
19FTW	TACAACAAAGGATGCTTTAGATAGAGCAGTTGCTGCTTATAACGCTCTTACTGCACAACA
9VSP	TACAACAAAGGATGCTTTAGATAGAGCAGTTGCTGCTTATAACGCTCTTACTGCACAACA
TIGR4	TACAACAAAGGATGCTTTAGATAGAGCAGTTGCTGCTTATAACGCTCTTACTGCACAACA
23FTW	AGAAGCGAAACAAGCGCTAGATGCAGCGATAGCAGCCTATA---CAAATGCTGCA-GATA
	* * * * * * * * * * * * * * *
14CSR	GCAAGCCGCTCAA-----GCTCTAGTAGATCAAGCACAGCAAGAATACAATGTAGCTTA
670	GCAAGCCGCTCAA-----GCTCTAGTAGATCAAGCACAGCAAGAATACAATGTAGCTTA
6BF	GCAAGCCGCTCAA-----GCTCTAGTAGATCAAGCACAGCAAGAATACAATGTAGCTTA
6BSP	GCAAGCCGCTCAA-----GCTCTAGTAGATCAAGCACAGCAAGAATACAATGTAGCTTA
19AH	GCAAGCCGCTCAA-----GCTCTAGTAGATCAAGCACAGCAAGAATACAATGTAGCTTA
23FPO	GCAAGCCGCTCAA-----GCTCTAGTAGATCAAGCACAGCAAGAATACAATGTAGCTTA
19FTW	ACAAACTCAGCAAGAAAAAGAGAAAGTTGACAAAGCTCAAGCTGCTTATAATGCTGCTGT
9VSP	ACAAACTCAGCAAGAAAAAGAGAAAGTTGACAAAGCTCAAGCTGCTTATAATGCTGCTGT
TIGR4	ACAAACTCAGCAAGAAAAAGAGAAAGTTGACAAAGCTCAAGCTGCTTATAATGCTGCTGT
23FTW	A-AAATGCAGCAC----AAGCTGTAGTAGATGCTGCGCAAAAAACATATAATGACAATTA
	* * * * * * * * * * * * * * *
14CSR	CAAAGAAGCCAA-----ATTTGGTTATGTTGAAGTAGCTGGAAAAGATGAAGCAATGGT
670	CAAAGAAGCCAA-----ATTTGGTTATGTTGAAGTAGCTGGAAAAGATGAAGCAATGGT
6BF	CAAAGAAGCCAA-----ATTTGGTTATGTTGAAGTAGCTGGAAAAGATGAAGCAATGGT
6BSP	CAAAGAAGCCAA-----ATTTGGTTATGTTGAAGTAGCTGGAAAAGATGAAGCAATGGT
19AH	CAAAGAAGCCAA-----ATTTGGTTATGTTGAAGTAGCTGGAAAAGATGAAGCAATGGT
23FPO	CAAAGAAGCCAA-----ATTTGGTTATGTTGAAGTAGCTGGAAAAGATGAAGCAATGGT
19FTW	GATTGCTGCCAACAATGCATTTGAATGGGTGGCAGATAAGGACAATGAAAATGTTGTGAA
9VSP	GATTGCTGCCAACAATGCATTTGAATGGGTGGCAGATAAGGACAATGAAAATGTTGTGAA
TIGR4	GATTGCTGCCAACAATGCATTTGAATGGGTGGCAGATAAGGACAATGAAAATGTTGTGAA
23FTW	CAGAGCAGCTAG-----ATTTGGCTATGTAGAAGTAGAGAGAAAGAAGATGCGTTAGT
	* * * * * * * * * * * * * * *

Figure 196W

PCT/US05/27239 416/487

14CSR TCTTACTTCTAATACGGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGTACTTATAA  
670 TCTTACTTCTAATACGGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGTACTTATAA  
6BF TCTTACTTCTAATACGGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGTACTTATAA  
6BSP TCTTACTTCTAATACGGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGTACTTATAA  
19AH TCTTACTTCTAATACGGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGTACTTATAA  
23FPO TCTTACTTCTAATACGGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGTACTTATAA  
19FTW ATTAGTTTCTGATGCACAAGGTCGCTTTGAAATTACAGGCCTTCTTGCAGGTACATATTA  
9VSP ATTAGTTTCTGATGCACAAGGTCGCTTTGAAATTACAGGCCTTCTTGCAGGTACATATTA  
TIGR4 ATTAGTTTCTGATGCACAAGGTCGCTTTGAAATTACAGGCCTTCTTGCAGGTACATATTA  
23FTW TCTTACTTCTAACACTGATGGTCAATTCCAAATTTTCAGGTCTTGCTGCTGGAAGCTACAC  
\* \* \* \* \*

14CSR ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT  
670 ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT  
6BF ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT  
6BSP ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT  
19AH ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT  
23FPO ATTAGAAGAAATTAAAGCTCCAGAAGGTTTTGCGAAAAT---TGATGATGTAGAATTTGT  
19FTW CTTAGAAGAAACAAAACAGCCTGCTGGTTATGCATTACTAAGTCCGTCAGAAATTTGA  
9VSP CTTAGAAGAAACAAAACAGCCTGCTGGTTATGCATTACTAAGTCCGTCAGAAATTTGA  
TIGR4 CTTAGAAGAAACAAAACAGCCTGCTGGTTATGCATTACTAAGTCCGTCAGAAATTTGA  
23FTW GTTGAAGAAACAAAAGCTCCAGAAGGCTTTGCAAACT---TGGAGATGTGAAGTTTGA  
\* \* \* \* \*

14CSR TGTGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA  
670 TGTGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA  
6BF TGTGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA  
6BSP TGTGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA  
19AH TGTGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA  
23FPO TGTGAGCAGGTTCTTG-----GAATCAAGGTGAGTTTAATTACTTAAAAGATGTTCA  
19FTW AGTCACTGCAACTTCTTATTCAGCGACTGGACAAGGCATTGAGTATACTGCTGGTTCAGG  
9VSP AGTCACTGCAACTTCTTATTCAGCGACTGGACAAGGCATTGAGTATACTGCTGGTTCAGG  
TIGR4 AGTCACTGCAACTTCTTATTCAGCGACTGGACAAGGCATTGAGTATACTGCTGGTTCAGG  
23FTW GGTGAGCAGGTTCTTG-----GAATCAAGGTGATTTCATTTAAAAGATGTTCA  
\* \* \* \* \*

14CSR AAAGAATGACGCTACAAAAGTAGTCAACAAAAAAATCACTATCCCACAAACGGGTGGTAT  
670 AAAGAATGACGCTACAAAAGTAGTCAACAAAAAAATCACTATCCCACAAACGGGTGGTAT  
6BF AAAGAATGACGCTACAAAAGTAGTCAACAAAAAAATCACTATCCCACAAACGGGTGGTAT  
6BSP AAAGAATGACGCTACAAAAGTAGTCAACAAAAAAATCACTATCCCACAAACGGGTGGTAT  
19AH AAAGAATGACGCTACAAAAGTAGTCAACAAAAAAATCACTATCCCACAAACGGGTGGTAT  
23FPO AAAGAATGACGCTACAAAAGTAGTCAACAAAAAAATCACGATCCCACAAACGGGTGGTAT  
19FTW TAAAGATGACGCTACAAAAGTAGTCAACAAAAAAATCACGATCCCACAAACGGGTGGTAT  
9VSP TAAAGATGACGCTACAAAAGTAGTCAACAAAAAAATCACGATCCCACAAACGGGTGGTAT  
TIGR4 TAAAGATGACGCTACAAAAGTAGTCAACAAAAAAATCACTATCCCACAAACGGGTGGTAT  
23FTW GAAGAACGACGCTACAAAAGTAGTCAACAAAAAAATCACGATCCCTCAAACGGGTGGTAT  
\* \* \* \* \*

14CSR TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA  
670 TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA  
6BF TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA  
6BSP TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA  
19AH TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA  
23FPO TGGTACAATTATCTTTGCTGTAGCAGGGGGCTGTGATTATGGGTATTGCAGTGTACGCATA  
19FTW TGGTACAATTATCTTTGCTGTAGCAGGGGGCTGTGATTATGGGTATTGCAGTGTACGCATA  
9VSP TGGTACAATTATCTTTGCTGTAGCAGGGGGCTGTGATTATGGGTATTGCAGTGTACGCATA  
TIGR4 TGGTACAATTATCTTTGCTGTAGCGGGGGCTGCGATTATGGGTATTGCAGTGTACGCATA  
23FTW TGGTACAATTATCTTTGCTGTAGCGGGGGCTGTGATTATGGGTATTGCAGTGTACGCATA  
\* \* \* \* \*

Figure 196X



14CSR	TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
670	TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
6BF	TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
6BSP	TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
19AH	TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
23FPO	TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
19FTW	TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
9VSP	TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
TIGR4	TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
23FTW	TGTTAAAAACAACAAAGATGAGGATCAACTTGCTTAAGTAAGAGAGAAAGGAGCCATTGA
	*****
14CSR	TGACAATGCAGAAAATGCAGAAAATG-----
670	TGACAATGCAGAAAATGCAGAAAATG-----
6BF	TGACAATGCAGAAAATGCAGAAAATG-----
6BSP	TGACAATGCAGAAAATGCAGAAAATG-----
19AH	TGACAATGCAGAAAATGCAGAAAATG-----
23FPO	TGACAATGCAGAAAATGCAGAAAATG-----
19FTW	TGACAATGCAGAAAATGCAGAAAATG-----
9VSP	TGACAATGCAGAAAATGCAGAAAATGCAGAAAATGCAGAAAATGCAGAAAATGCAGAAAA
TIGR4	TGACAATGCAGAAAATGCAGAAAATG-----
23FTW	TGACAATGCAGAAAATGCAGAAAATG-----
	*****
14CSR	--ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
670	--ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
6BF	--ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
6BSP	--ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
19AH	--ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
23FPO	--ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
19FTW	--ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
9VSP	TGATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
TIGR4	--ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
23FTW	--ATTAGTCGTATCTTCTTTGTTATGGCTCTGTGTTTTCTCTTGATGGGGTGCACATG
	*****
14CSR	CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
670	CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
6BF	CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
6BSP	CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
19AH	CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
23FPO	CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
19FTW	CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
9VSP	CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
TIGR4	CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
23FTW	CAGTCCAAGCGCAAGAAGATCACACGTTGGTCTTGCAATTGGAGAACTATCAGGAGGTGG
	*****
14CSR	TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTTCGT
670	TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTTCGT
6BF	TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTTCGT
6BSP	TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTTCGT
19AH	TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTTCGT
23FPO	TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTTCGT
19FTW	TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTTCGT
9VSP	TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTTCGT
TIGR4	TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTTCGT
23FTW	TTAGTCAATTGCCATCTCGTGATGGTCATCGGTTGCAAGTATGGAAGTTGGATGATTTCGT
	*****

Figure 196Y



14CSR ATTCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTTCGTGGGATGAGAATAAAC  
670 ATTCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTTCGTGGGATGAGAATAAAC  
6BF ATTCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTTCGTGGGATGAGAATAAAC  
6BSP ATTCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTTCGTGGGATGAGAATAAAC  
19AH ATTCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTTCGTGGGATGAGAATAAAC  
23FPO ATTCCTATGATAATCGGGTGCAAATTGTGAGAGACTTGCATTTCGTGGGATGAGAATAAAC  
19FTW ATTCCTATGATAATCGGGTGCAAATTGTGAGAGACTTGCATTTCGTGGGATGAGAATAAAC  
9VSP ATTCCTATGATAATCGGGTGCAAATTGTGAGAGACTTGCATTTCGTGGGATGAGAATAAAC  
TIGR4 ATTCCTATGATGATCGGGTGCAAATTGTAAGAGACTTGCATTTCGTGGGATGAGAATAAAC  
23FTW ATTCCTATGATAATCGGGTGCAAATTGTGAGAGACTTGCATTTCGTGGGATGAGAATAAAC  
\*\*\*\*\*

14CSR TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT  
670 TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT  
6BF TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT  
6BSP TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT  
19AH TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT  
23FPO TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT  
19FTW TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT  
9VSP TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT  
TIGR4 TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT  
23FTW TTTCTTCTTTCAAAAAGACTTCGTTTGAGATGACCTTCCTTGAGAATCAGATTGAAGTAT  
\*\*\*\*\*

14CSR CTCATATTCCAAATGGTCTTTACTATGTTTCGCTCTATTATCCAGACGGATGCGGTTTCTT  
670 CTCATATTCCAAATGGTCTTTACTATGTTTCGCTCTATTATCCAGACGGATGCGGTTTCTT  
6BF CTCATATTCCAAATGGTCTTTACTATGTTTCGCTCTATTATCCAGACGGATGCGGTTTCTT  
6BSP CTCATATTCCAAATGGTCTTTACTATGTTTCGCTCTATTATCCAGACGGATGCGGTTTCTT  
19AH CTCATATTCCAAATGGTCTTTACTATGTTTCGCTCTATTATCCAGACGGATGCGGTTTCTT  
23FPO CTCATATTCCAAATGGTCTTTACTATGTTTCGCTCTATTATCCAGACGGATGCGGTTTCTT  
19FTW CTCATATTCCAAATGGTCTTTACTATGTTTCGCTCTATTATCCAGACGGATGCGGTTTCTT  
9VSP CTCATATTCCAAATGGTCTTTACTATGTTTCGCTCTATTATCCAGACGGATGCGGTTTCTT  
TIGR4 CTCATATTCCAAATGGTCTTTACTATGTTTCGCTCTATTATCCAGACGGATGCGGTTTCTT  
23FTW CTCATATTCCAAATGGTCTTTACTATGTTTCGCTCTATTATCCAGACGGATGCGGTTTCTT  
\*\*\*\*\*

14CSR ATCCAGCTGAATTTCTTTTGAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG  
670 ATCCAGCTGAATTTCTTTTGAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG  
6BF ATCCAGCTGAATTTCTTTTGAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG  
6BSP ATCCAGCTGAATTTCTTTTGAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG  
19AH ATCCAGCTGAATTTCTTTTGAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG  
23FPO ATCCAGCTGAATTTCTTTTGAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG  
19FTW ATCCAGCTGAATTTCTTTTGAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG  
9VSP ATCCAGCTGAATTTCTTTTGAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG  
TIGR4 ATCCAGCTGAATTTCTTTTGAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG  
23FTW ATCCAGCTGAATTTCTTTTGAATGACAGATCAAACGGTAGAGCCTTTGGTCATTGTAG  
\*\*\*\*\*

14CSR CGAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA  
670 CGAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA  
6BF CGAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA  
6BSP CGAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA  
19AH CGAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA  
23FPO CGAAAAAGCAGATACGGTGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA  
19FTW CGAAAAAGCAGATACGGTGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA  
9VSP CGAAAAAGCAGATACGGTGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA  
TIGR4 CGAAAAAACAGATACAATGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA  
23FTW CGAAAAAGCAGATACGGTGACAACAAAGGTGAAGCTGATAAAGGTGGATCAAGACCACA  
\*\*\*\*\*

Figure 196X

14CSR ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG  
670 ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG  
6BF ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG  
6BSP ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG  
19AH ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG  
23FPO ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG  
19FTW ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG  
9VSP ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG  
TIGR4 ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG  
23FTW ATCGCTTGGAGGGTGTCTGGCTTTAAATTGGTATCAGTAGCAAGAGATGGTTCTGAAAAAG  
\*\*\*\*\*

14CSR AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT  
670 AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT  
6BF AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT  
6BSP AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT  
19AH AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT  
23FPO AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT  
19FTW AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT  
9VSP AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT  
TIGR4 AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT  
23FTW AGGTTCCCTTGATTGGAGAATACCGTTACAGTTCTTCTGGTCAAGTAGGGAGAACTCTCT  
\*\*\*\*\*

14CSR ATACTGATAAAAAATGGAGAGATTTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA  
670 ATACTGATAAAAAATGGAGAGATTTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA  
6BF ATACTGATAAAAAATGGAGAGATTTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA  
6BSP ATACTGATAAAAAATGGAGAGATTTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA  
19AH ATACTGATAAAAAATGGAGAGATTTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA  
23FPO ATACTGATAAAAAATGGAGAGATTTGTTGTGACAAATCTTCCTCTTGGGACCTATCGTTTCA  
19FTW ATACTGATAAAAAATGGAGAGATTTGTTGTGACAAATCTTCCTCTTGGGACCTATCGTTTCA  
9VSP ATACTGATAAAAAATGGAGAGATTTGTTGTGACAAATCTTCCTCTTGGGACCTATCGTTTCA  
TIGR4 ATACTGATAAAAAATGGAGAGATTTTTGTGACAAATCTTCCTCTTGGGAACTATCGTTTCA  
23FTW ATACTGATAAAAAATGGAGAGATTTGTTGTGACAAATCTTCCTCTTGGGACCTATCGTTTCA  
\*\*\*\*\*

14CSR AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG  
670 AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG  
6BF AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG  
6BSP AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG  
19AH AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG  
23FPO AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGTTGG  
19FTW AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGTTGG  
9VSP AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGTTGG  
TIGR4 AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGCTGG  
23FTW AGGAGGTGGAGCCACTGGCAGGCTATGCTGTTACGACGCTGGATACGGATGTCCAGTTGG  
\*\*\*\*\*

14CSR TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG  
670 TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG  
6BF TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG  
6BSP TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG  
19AH TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG  
23FPO TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG  
19FTW TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG  
9VSP TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG  
TIGR4 TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG  
23FTW TAGATCATCAGCTGGTGACGATTACGGTTGTCAATCAGAAATTACCACGTGGCAATGTTG  
\*\*\*\*\*

Figure 196AA



PCT/US05/27239 420/487

14CSR ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA  
670 ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA  
6BF ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA  
6BSP ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA  
19AH ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA  
23FPO ACTTTATGAAGGTGGATGGTAGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA  
19FTW ACTTTATGAAGGTGGATGGTAGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA  
9VSP ACTTTATGAAGGTGGATGGTAGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA  
TIGR4 ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA  
23FTW ACTTTATGAAGGTGGATGGTCGGACCAATACCTCTCTTCAAGGGGCAATGTTCAAAGTCA  
\*\*\*\*\*

14CSR TGAAAGAAGAAAGCGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA  
670 TGAAAGAAGAAAGCGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA  
6BF TGAAAGAAGAAAGCGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA  
6BSP TGAAAGAAGAAAGCGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA  
19AH TGAAAGAAGAAAGCGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA  
23FPO TGAAAGAAGAAAACGGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTGG  
19FTW TGAAAGAAGAAAACGGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTGG  
9VSP TGAAAGAAGAAAACGGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTGG  
TIGR4 TGAAAGAAGAAAGCGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTAA  
23FTW TGAAAGAAGAAAACGGGACACTATACTCCTGTTCTTCAAAATGGTAAGGAAGTAGTTGTGG  
\*\*\*\*\*

14CSR CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT  
670 CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT  
6BF CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT  
6BSP CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT  
19AH CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT  
23FPO CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT  
19FTW CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT  
9VSP CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT  
TIGR4 CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT  
23FTW CATCAGGGAAAGATGGTCGTTTCCGAGTGGAAGGTCTAGAGTATGGGACATACTATTTAT  
\*\*\*\*\*

14CSR GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG  
670 GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG  
6BF GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG  
6BSP GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG  
19AH GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG  
23FPO GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG  
19FTW GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG  
9VSP GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG  
TIGR4 GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG  
23FTW GGGAGCTCCAAGCTCCAAGTGGTTATGTTCAATTAACATCGCCTGTTTCCTTTACAATCG  
\*\*\*\*\*

14CSR GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG  
670 GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG  
6BF GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG  
6BSP GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG  
19AH GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG  
23FPO GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG  
19FTW GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG  
9VSP GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG  
TIGR4 GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG  
23FTW GGAAAGATACTCGTAAGGAACTGGTAACAGTGGTTAAAAATAACAAGCGACCACGGATTG  
\*\*\*\*\*

Figure 196AB

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14CSR ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTTGCCATTTTGTGT  
670 ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTTGCCATTTTGTGT  
6BF ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTTGCCATTTTGTGT  
6BSP ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTTGCCATTTTGTGT  
19AH ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTTGCCATTTTGTGT  
23FPO ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTTGCCATTTTGTGT  
19FTW ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTTGCCATTTTGTGT  
9VSP ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTTGCCATTTTGTGT  
TIGR4 ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTTGCCATTTTGTGT  
23FTW ATGTGCCAGATACAGGGGAAGAAACCTTGTATATCTTGATGCTTGTTGCCATTTTGTGT  
\*\*\*\*\*

14CSR TTGGTAGTGGTTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA  
670 TTGGTAGTGGTTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA  
6BF TTGGTAGTGGTTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA  
6BSP TTGGTAGTGGTTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA  
19AH TTGGTAGTGGTTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA  
23FPO TTGGTAGTGGCTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA  
19FTW TTGGTAGTGGCTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA  
9VSP TTGGTAGTGGCTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA  
TIGR4 TTGGTAGTGGCTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA  
23FTW TTGGTAGTGGCTATTATCTTACGAAAAAACCAAATAACTGATATTCAATGTACATCATTA  
\*\*\*\*\*

14CSR TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA  
670 TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA  
6BF TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA  
6BSP TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA  
19AH TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA  
23FPO TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA  
19FTW TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA  
9VSP TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA  
TIGR4 TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA  
23FTW TGAAAAAGATAGCAGGCTGAAGGGAAGACCAGAGTACTCTGAGGTGATGTTAATCAGGAA  
\*\*\*\*\*

14CSR TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC  
670 TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC  
6BF TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC  
6BSP TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC  
19AH TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC  
23FPO TCATGGTGATTTGGCATGAATCATAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC  
19FTW TCATGGTGATTTGGCATGAATCATAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC  
9VSP TCATGGTGATTTGGCATGAATCATAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC  
TIGR4 TCATGGTGATGTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC  
23FTW TCATGGTGATTTGGCATGAATCACAATAACGGATATGAGGCTGGGCAGATTGTGCCAGCC  
\*\*\*\*\*

14CSR TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG  
670 TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG  
6BF TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG  
6BSP TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG  
19AH TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG  
23FPO TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG  
19FTW TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG  
9VSP TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG  
TIGR4 TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG  
23FTW TCATTGTGGGTTATTGTTTGTAAAACGATAGGACTGGTCTGGTAATCATTTTAGGAATGG  
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Figure 196AC



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14CSR ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAAGAAATGAGATTTTCTCG  
670 ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAAGAAATGAGATTTTCTCG  
6BF ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAAGAAATGAGATTTTCTCG  
6BSP ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAAGAAATGAGATTTTCTCG  
19AH ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAAGAAATGAGATTTTCTCG  
23FPO ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAAGAAATGAGATTTTCTCG  
19FTW ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAAGAAATGAGATTTTCTCG  
9VSP ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAAGAAATGAGATTTTCTCG  
TIGR4 ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAAGAAATGAGATTTTCTCG  
23FTW ACAGGACTGGGATTCTGATTTAAAATGGATGGTGAATCAGAAAAGAAATGAGATTTTCTCG  
\*\*\*\*\*

14CSR TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT  
670 TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT  
6BF TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT  
6BSP TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT  
19AH TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT  
23FPO TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGTT  
19FTW TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGTT  
9VSP TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGTT  
TIGR4 TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT  
23FTW TTTCTCTTAGCAGATAGGATTGTCTGTTAGGAAAAGCGATAAAATGATGAGTTTGAAGAT  
\*\*\*\*\*

14CSR AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT  
670 AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT  
6BF AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT  
6BSP AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT  
19AH AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT  
23FPO AAAGGAATGCTGATAAAAAATGGCAAAAACAAAAAGCAAAAACGAAACAATCTCCTATT  
19FTW AAAGGAATGCTGATAAAAAATGGCAAAAACAAAAAGCAAAAACGAAACAATCTCCTATT  
9VSP AAAGGAATGCTGATAAAAAATGGCAAAAACAAAAAGCAAAAACGAAACAATCTCCTATT  
TIGR4 AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT  
23FTW AAAGGGATGCTGATAAAAA-TGGTAAAAACAAAAAGCAAAAACGAAATAATCTCCTATT  
\*\*\*\*\*

14CSR AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA  
670 AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA  
6BF AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA  
6BSP AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA  
19AH AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA  
23FPO AGGAGTGGTATTTTTTCATTGGAATAGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA  
19FTW AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA  
9VSP AGGAGTGGTATTTTTTCATTGGAATAGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA  
TIGR4 AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA  
23FTW AGGAGTGGTATTTTTTCATTGGAATGGCGGTAATGGCGTATCCGCTGGTGTCTCGCTTGTA  
\*\*\*\*\*

14CSR TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA  
670 TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA  
6BF TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA  
6BSP TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA  
19AH TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA  
23FPO TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA  
19FTW TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA  
9VSP TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA  
TIGR4 TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA  
23FTW TTATCGAGTGGAATCAAATCAACAAATTGCTGACTTTGATAAGGAAAAAGCAACGTTGGA  
\*\*\*\*\*

Figure 196AD

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14CSR TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA  
670 TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA  
6BF TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA  
6BSP TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA  
19AH TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA  
23FPO TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA  
19FTW TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA  
9VSP TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA  
TIGR4 TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA  
23FTW TGAGGCTGACATTGATGAACGAATGAAATTGGCACAAGCCTTCAATGACTCTTTGAATAA  
\*\*\*\*\*

14CSR TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC  
670 TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC  
6BF TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC  
6BSP TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC  
19AH TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC  
23FPO TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC  
19FTW TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC  
9VSP TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC  
TIGR4 TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC  
23FTW TGTAGTGAGTGGCGATCCTTGGTCGGAAGAAATGAAGAAAAAAGGGCGAGCAGAGTATGC  
\*\*\*\*\*

14CSR ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA  
670 ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA  
6BF ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA  
6BSP ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA  
19AH ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA  
23FPO ACGCATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCTGCTATTGATGTAGA  
19FTW ACGCATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCTGCTATTGATGTAGA  
9VSP ACGCATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCTGCTATTGATGTAGA  
TIGR4 ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA  
23FTW ACGTATGTTAGAAATCCATGAGCGGATGGGGCATGTGGAAATCCCCGTTATTGACGTGGA  
\*\*\* \*\*\*\*\* \*

14CSR TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA  
670 TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA  
6BF TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA  
6BSP TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA  
19AH TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA  
23FPO TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA  
19FTW TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA  
9VSP TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA  
TIGR4 TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA  
23FTW TTTGCCGGTTTATGCTGGTACTGCTGAAGAGGTATTGCAGCAAGGGGCTGGGCATCTAGA  
\*\*\*\*\*

14CSR GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG  
670 GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG  
6BF GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG  
6BSP GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG  
19AH GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG  
23FPO GGGAACTTCTCTACCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG  
19FTW GGGAACTTCTCTACCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG  
9VSP GGGAACTTCTCTACCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG  
TIGR4 GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG  
23FTW GGGAACTTCTCTGCCGATCGGAGGCAATTCGACCCATGCGGTGATTACGGCACATACAGG  
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Figure 196AE



PCT/US05/27239

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14CSR TTTGCCAACAGCTAAGATGTTTACGGATTTGACCAAACCTAAAGTTGGGGATAAGTTT  
670 TTTGCCAACAGCTAAGATGTTTACGGATTTGACCAAACCTAAAGTTGGGGATAAGTTT  
6BF TTTGCCAACAGCTAAGATGTTTACGGATTTGACCAAACCTAAAGTTGGGGATAAGTTT  
6BSP TTTGCCAACAGCTAAGATGTTTACGGATTTGACCAAACCTAAAGTTGGGGATAAGTTT  
19AH TTTGCCAACAGCTAAGATGTTTACGGATTTGACCAAACCTAAAGTTGGGGATAAGTTT  
23FPO TTTGCCAACAGCTAAGATGTTTACGGATTTGACCAAACCTAAAGTTGGGGATAAGTTT  
19FTW TTTGCCAACAGCTAAGATGTTTACGGATTTGACCAAACCTAAAGTTGGGGATAAGTTT  
9VSP TTTGCCAACAGCTAAGATGTTTACGGATTTGACCAAACCTAAAGTTGGGGATAAGTTT  
TIGR4 TTTGCCAACAGCTAAGATGTTTACGGATTTGACCAAACCTAAAGTTGGGGATAAGTTT  
23FTW TTTGCCAACAGCTAAGATGTTTACGGATTTGACCAAACCTAAAGTTGGGGATAAGTTT  
\*\*\*\*\* \*\*

14CSR TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC  
670 TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC  
6BF TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC  
6BSP TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC  
19AH TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC  
23FPO TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC  
19FTW TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC  
9VSP TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC  
TIGR4 TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC  
23FTW TGTGCACAATATCAAGGAAGTGATGGCCTATCAAGTGGATCAAGTAAAGGTGATTGAGCC  
\*\*\*\*\*

14CSR GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG  
670 GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG  
6BF GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG  
6BSP GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG  
19AH GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG  
23FPO GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG  
19FTW GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG  
9VSP GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG  
TIGR4 GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG  
23FTW GACGAACTTTGATGATTTATTGATTGTACCAGGTCATGATTATGTGACCTTGCTGACTTG  
\*\*\*\*\* \*\*

14CSR TACGCCATACATGATCAATACCCATCGTCTATTGGTTTCGGGGGCATCGGATACCGTACGT  
670 TACGCCATACATGATCAATACCCATCGTCTATTGGTTTCGGGGGCATCGGATACCGTACGT  
6BF TACGCCATACATGATCAATACCCATCGTCTATTGGTTTCGGGGGCATCGGATACCGTACGT  
6BSP TACGCCATACATGATCAATACCCATCGTCTATTGGTTTCGGGGGCATCGGATACCGTACGT  
19AH TACGCCATACATGATCAATACCCATCGTCTATTGGTTTCGGGGGCATCGGATACCGTACGT  
23FPO TACGCCATACATGATCAATACCCATCGTCTATTGGTTTCGGGGGCATCGGATACCGTACGT  
19FTW TACGCCATACATGATCAATACCCATCGTCTATTGGTTTCGGGGGCATCGGATACCGTACGT  
9VSP TACGCCATACATGATCAATACCCATCGTCTATTGGTTTCGGGGGCATCGGATACCGTACGT  
TIGR4 TACGCCATACATGATCAATACCCATCGTCTATTGGTTTCGGGGGCATCGGATACCGTACGT  
23FTW TACGCCATACATGATCAATACCCATCGTCTATTGGTTTCGGGGGCATCGGATACCGTACGT  
\*\*\*\*\*

14CSR AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT  
670 AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT  
6BF AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT  
6BSP AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT  
19AH AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT  
23FPO AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT  
19FTW AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT  
9VSP AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT  
TIGR4 AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT  
23FTW AGCAGAGGTTGAGGAAGAATTTATTGCAGCAAACAACTCAGTCATCTCTATCGCTACCT  
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Figure 196AF

14CSR GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA  
670 GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA  
6BF GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA  
6BSP GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA  
19AH GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA  
23FPO GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA  
19FTW GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA  
9VSP GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA  
TIGR4 GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA  
23FTW GTTTTATGTGGCAGTTGGTTTGATTGTGATTCTTTTATGGATTATTTCGACGCTTGCGCAA  
\*\*\*\*\*

14CSR GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA  
670 GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA  
6BF GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA  
6BSP GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA  
19AH GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA  
23FPO GAAGAAACGGCAATCAGAAAGAGCTTTGAAAGCATTGAAGGAAGCTACTAAGGAAGTGAA  
19FTW GAAGAAACGGCAATCAGAAAGAGCTTTGAAAGCATTGAAGGAAGCTACTAAGGAAGTGAA  
9VSP GAAGAAACGGCAATCAGAAAGAGCTTTGAAAGCATTGAAGGAAGCTACTAAGGAAGTGAA  
TIGR4 GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA  
23FTW GAAGAAAAACAACCGGAAAAGGCTTTGAAGGCGCTGAAAGCAGCAAGGAAGGAAGTGAA  
\*\*\*\*\*

14CSR GGTGGAGGATGGACAACAGTAGACGTTACGAAAAAAGGCACAAAAAAGAAGAAACATC  
670 GGTGGAGGATGGACAACAGTAGACGTTACGAAAAAAGGCACAAAAAAGAAGAAACATC  
6BF GGTGGAGGATGGACAACAGTAGACGTTACGAAAAAAGGCACAAAAAAGAAGAAACATC  
6BSP GGTGGAGGATGGACAACAGTAGACGTTACGAAAAAAGGCACAAAAAAGAAGAAACATC  
19AH GGTGGAGGATGGACAACAGTAGACGTTACGAAAAAAGGCACAAAAAAGAAGAAACATC  
23FPO GGTAGAGGATGAGTAAGAGTAGATATTACGAAAAAAGAGCGTGAAAAAGAAGAAAAATC  
19FTW GGTAGAGGATGAGTAAGAGTAGATATTACGAAAAAAGAGCGTGAAAAAGAAGAAAAATC  
9VSP GGTAGAGGATGAGTAAGAGTAGATATTACGAAAAAAGAGCGTGAAAAAGAAGAAAAATC  
TIGR4 GGTGGAGGATGGACAACAGTAGACGTTACGAAAAAAGGCACAAAAAAGAAGAAACATC  
23FTW GGTGGAGGATGGACAACAGTAGACGTTACGAAAAAAGGCACAAAAAAGAAGAAACATC  
\*\*\* \*\*\*\*\*

14CSR CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT  
670 CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT  
6BF CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT  
6BSP CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT  
19AH CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT  
23FPO CGTTCATTCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT  
19FTW CGTTCATTCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT  
9VSP CGTTCATTCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT  
TIGR4 CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT  
23FTW CGCTGATCCTTCTTCTGATTTTCTTAGTAGGATTGCGCGTTGCGATATATCCATTGGTGT  
\*\* \* \*

14CSR CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT  
670 CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT  
6BF CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT  
6BSP CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT  
19AH CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT  
23FPO CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT  
19FTW CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT  
9VSP CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT  
TIGR4 CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT  
23FTW CTCGTTATTATTATCGTATTGAGTCAAACGAGGTTATTAAAGAGTTTGATGAGACGGTTT  
\*\*\*\*\*

Figure 196AG



14CSR CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA  
670 CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA  
6BF CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA  
6BSP CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA  
19AH CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA  
23FPO CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA  
19FTW CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA  
9VSP CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA  
TIGR4 CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA  
23FTW CCCAGATGGATAAGGCAGAACTTGAGGAGCGTTGGCGCTTGGCTCAAGCCTTCAATGCGA  
\*\*\*\*\*

14CSR CCTTGAAACCATCTGAAATTCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT  
670 CCTTGAAACCATCTGAAATTCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT  
6BF CCTTGAAACCATCTGAAATTCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT  
6BSP CCTTGAAACCATCTGAAATTCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT  
19AH CCTTGAAACCATCTGAAATTCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT  
23FPO CCTTGAAACCATCTGAAATTCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT  
19FTW CCTTGAAACCATCTGAAATCCTCGATCCTTTTACAGATCAGGAAAAAGAAACAGGGAGTTT  
9VSP CCTTGAAACCATCTGAAATTCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT  
TIGR4 CCTTGAAACCATCTGAAATTCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT  
23FTW CCTTGAAACCATCTGAAATTCTTGATCCTTTTACAGAGCAAGAGAAAAAGAAAGGCGTCT  
\*\*\*\*\*

14CSR CAGAAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA  
670 CAGAAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA  
6BF CAGAAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA  
6BSP CAGAAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA  
19AH CAGAAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA  
23FPO CAGAAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA  
19FTW CAGAAATATGCTAACATGCTAAAGGTTCATGAGCGTATCGGATATGTAGAAATTCCTGCGA  
9VSP CAGAAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA  
TIGR4 CAGAAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA  
23FTW CAGAAATATGCCAATATGCTAAAGGTCCATGAGCGGATTGGCTATGTGGAAATTCCTGCGA  
\*\*\*\*\*

14CSR TTGATCAGGAAATTCGGATGTATGTGCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG  
670 TTGATCAGGAAATTCGGATGTATGTGCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG  
6BF TTGATCAGGAAATTCGGATGTATGTGCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG  
6BSP TTGATCAGGAAATTCGGATGTATGTGCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG  
19AH TTGATCAGGAAATTCGGATGTATGTGCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG  
23FPO TTGATCAGGAAATTCGGATGTATGTGCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG  
19FTW TTGAACAGGAAATCCCCATGTATGTTGGCACAAGTGAAGACATTCCTCAGAAAGGGGCGCAG  
9VSP TTGATCAGGAAATTCGGATGTATGTGCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG  
TIGR4 TTGATCAGGAAATTCGGATGTATGTGCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG  
23FTW TTGATCAGGAAATTCGGATGTATGTGCGGAACGAGTGAGGAAATTCCTCAGAAGGGGCGCAG  
\*\*\*\*\*

14CSR GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAATAACCCACACAGTTGTCACTG  
670 GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAATAACCCACACAGTTGTCACTG  
6BF GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAATAACCCACACAGTTGTCACTG  
6BSP GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAATAACCCACACAGTTGTCACTG  
19AH GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAATAACCCACACAGTTGTCACTG  
23FPO GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAATAACCCACACAGTTGTCACTG  
19FTW GGCTGTTAGAAGGGGCTTCGCTGCCTGTTGGAGGTGAATAACCCATACAGTGATCACTG  
9VSP GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAATAACCCACACAGTTGTCACTG  
TIGR4 GGCTGTTAGAAGGGGCTTCGCTGCCTGTTGGAGGTGAATAACCCATACAGTGATCACTG  
23FTW GATTGCTAGAGGGAGCTTCGTTACCGGTTGGTGGTGAATAACCCACACAGTTGTCACTG  
\* \* \* \* \*

Figure 196AH

PCT/US2005/027239

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14CSR CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG  
670 CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG  
6BF CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG  
6BSP CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG  
19AH CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG  
23FPO CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG  
19FTW CTCACAGAGGATTGCCAACGGCAGAACTGTTTTCAGTCAATTGGATAAGATGAAGAAAGGGG  
9VSP CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG  
TIGR4 CTCACAGAGGATTGCCAACGGCAGAACTGTTTTCAGTCAATTGGATAAGATGAAAAAAGGGG  
23FTW CTCATAGAGGATTACCGACGGCAGAACTGTTTAGTCAATTGGATAAGATGAAAAAAGGGG  
\*\*\*\*\*

14CSR ATGTCTTTTATCTTCACGTTTGTAGACCAGGTGTTGGCCTACCAAGTGGATCAGATTTTGA  
670 ATGTCTTTTATCTTCACGTTTGTAGACCAGGTGTTGGCCTACCAAGTGGATCAGATTTTGA  
6BF ATGTCTTTTATCTTCACGTTTGTAGACCAGGTGTTGGCCTACCAAGTGGATCAGATTTTGA  
6BSP ATGTCTTTTATCTTCACGTTTGTAGACCAGGTGTTGGCCTACCAAGTGGATCAGATTTTGA  
19AH ATGTCTTTTATCTTCACGTTTGTAGACCAGGTGTTGGCCTACCAAGTGGATCAGATTTTGA  
23FPO ATATCTTTTATCTTCACGTTTGTAGATCAGGTGTTGGCCTACCAAGTGGATCAGATAGTGA  
19FTW ATATCTTTTATCTTCACGTTTGTAGACCAGGTGTTGGCCTATCAAGTGGATCAGATAGTGA  
9VSP ATATCTTTTATCTTCACGTTTGTAGATCAGGTGTTGGCCTACCAAGTGGATCAGATAGTGA  
TIGR4 ATATCTTTTATCTTCACGTTTGTAGATCAGGTGTTGGCCTACCAAGTGGATCAGATAGTGA  
23FTW ATGTCTTTTATCTTCACGTTTGTAGACCAGGTGTTGGCCTACCAAGTGGATCAGATTTTGA  
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14CSR CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT  
670 CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT  
6BF CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT  
6BSP CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT  
19AH CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT  
23FPO CGGTTGAGCCGAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT  
19FTW CGGTTGAGCCGAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACTT  
9VSP CGGTTGAGCCGAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT  
TIGR4 CGGTTGAGCCGAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT  
23FTW CGGTTGAGCCAAATGACTTTGAGCCTGTCTTGATTCAACATGGGGAAGATTATGCGACCT  
\*\*\*\*\*

14CSR TGTGACCTGTACACCGTATATGATTAAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA  
670 TGTGACCTGTACACCGTATATGATTAAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA  
6BF TGTGACCTGTACACCGTATATGATTAAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA  
6BSP TGTGACCTGTACACCGTATATGATTAAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA  
19AH TGTGACCTGTACACCGTATATGATTAAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA  
23FPO TGTGACTTGTACACCGTATATGATTAAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA  
19FTW TACTGACTTGTACGCCATACATGATTAAACAGCCACCGTTTGTGGTACGTGGGAAACGGA  
9VSP TGTGACTTGTACACCGTATATGATTAAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA  
TIGR4 TGTGACTTGTACACCGTATATGATTAAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA  
23FTW TGTGACCTGTACACCGTATATGATTAAACAGTCATCGTCTGTTGGTACGTGGGAAGCGGA  
\* \*\*\*\*\*

14CSR TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT  
670 TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT  
6BF TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT  
6BSP TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT  
19AH TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT  
23FPO TTCCGTATACGGCACCAATTGCAGAGCGGAATCGAGCGGTGAGAGAGCGTGGGCAATTCT  
19FTW TTCCATATACAGCGCCGATTGCTGAGCGGAATCGAGCGGTGAGAGAGCGTGGGCAATTCT  
9VSP TTCCGTATACGGCACCAATTGCAGAGCGGAATCGAGCGGTGAGAGAGCGTGGGCAATTCT  
TIGR4 TTCCGTATACGGCACCAATTGCAGAGCGGAATCGAGCGGTGAGAGAGCGTGGGCAATTCT  
23FTW TTCCGTATACGGCACCAATTGCAGAGCGAAATCGAGCGGTGAGAGAGCGTGGGCAATTCT  
\*\*\*\*\*

Figure 196I



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14CSR GGTGTGGTTATTGCTAGCGGCGTTGGTTATGATTCTGGTATTGAGTTACGGGGTGTATC  
670 GGTGTGGTTATTGCTAGCGGCGTTGGTTATGATTCTGGTATTGAGTTACGGGGTGTATC  
6BF GGTGTGGTTATTGCTAGCGGCGTTGGTTATGATTCTGGTATTGAGTTACGGGGTGTATC  
6BSP GGTGTGGTTATTGCTAGCGGCGTTGGTTATGATTCTGGTATTGAGTTACGGGGTGTATC  
19AH GGTGTGGTTATTGCTAGCGGCGTTGGTTATGATTCTGGTATTGAGTTACGGGGTGTATC  
23FPO GGTGTGGTTATTACTAGGAGCGATGGCGGTCATCCTTCTCTTGCTGTATCGCGTGTATC  
19FTW GGTGTGGTTATTACTAGGAGCGATGGCGGTCATCCTTCTCTTGCTGTATCGCGTGTATC  
9VSP GGTGTGGTTATTACTAGGAGCGATGGCGGTCATCCTTCTCTTGCTGTATCGCGTGTATC  
TIGR4 GGTGTGGTTATTACTAGGAGCGATGGCGGTCATCCTTCTCTTGCTGTATCGCGTGTATC  
23FTW GGTGTGGTTATTGCTAGCGGCGTTGGTTATGATTCTGGTATTGAGTTACGGGGTGTATC  
\*\*\*\*\*

14CSR GTCATCGTCGCATTGTCAAAGGGCTAGAAAAACAATTGGAGGAGCATCATGTCAAAGGCT  
670 GTCATCGTCGCATTGTCAAAGGGCTAGAAAAACAATTGGAGGAGCATCATGTCAAAGGCT  
6BF GTCATCGTCGCATTGTCAAAGGGCTAGAAAAACAATTGGAGGAGCATCATGTCAAAGGCT  
6BSP GTCATCGTCGCATTGTCAAAGGGCTAGAAAAACAATTGGAGGAGCATCATGTCAAAGGCT  
19AH GTCATCGTCGCATTGTCAAAGGGCTAGAAAAACAATTGGAGGAGCATCATGTCAAAGGCT  
23FPO GTAATCGACGGATTGTCAAAGGACTAGAAAAGCAATTGGAGGGGCGTCATGTCAAGGACT  
19FTW GTAATCGACGGATTGTCAAAGGACTAGAAAAGCAATTGGAGGGGCGTCATGTCAAGGACT  
9VSP GTAATCGACGGATTGTCAAAGGACTAGAAAAGCAATTGGAGGGGCGTCATGTCAAGGACT  
TIGR4 GTAATCGACGGATTGTCAAAGGACTAGAAAAGCAATTGGAGGGGCGTCATGTCAAGGACT  
23FTW GTCATCGTCGCATTGTCAAAGGGCTAGAAAAACAATTGGAGGAGCATCATGTCAAAGGCT  
\*\*

14CSR AAGCTACAGAAATTACTAGGGTATTTGCTGATGCTGGTAGCATTGGTGATTCCTGTTTAT  
670 AAGCTACAGAAATTACTAGGGTATTTGCTGATGCTGGTAGCATTGGTGATTCCTGTTTAT  
6BF AAGCTACAGAAATTACTAGGGTATTTGCTGATGCTGGTAGCATTGGTGATTCCTGTTTAT  
6BSP AAGCTACAGAAATTACTAGGGTATTTGCTGATGCTGGTAGCATTGGTGATTCCTGTTTAT  
19AH AAGCTACAGAAATTACTAGGGTATTTGCTGATGCTGGTAGCATTGGTGATTCCTGTTTAT  
23FPO AAATACGAGCCTTATTGGGATACTTGTGATGTTGGTAGCCTGTTTGATTCCATTATTTAT  
19FTW AAATACGAGCCTTATTGGGATACTTGTGATGTTGGTAGCCTGTTTGATTCCATTATTTAT  
9VSP AAATACGAGCCTTATTGGGATACTTGTGATGTTGGTAGCCTGTTTGATTCCATTATTTAT  
TIGR4 AAATACGAGCCTTATTGGGATACTTGTGATGTTGGTAGCCTGTTTGATTCCATTATTTAT  
23FTW AAGCTACAGAAATTACTAGGGTATTTGCTGATGCTGGTAGCATTGGTGATTCCTGTTTAT  
\*\*

14CSR TGTTTTGGGCAGATGGTGTTACAGTCTTTAGGACAAGTAAAAGGTCATGAGATATTTTCA  
670 TGTTTTGGGCAGATGGTGTTACAGTCTTTAGGACAAGTAAAAGGTCATGAGATATTTTCA  
6BF TGTTTTGGGCAGATGGTGTTACAGTCTTTAGGACAAGTAAAAGGTCATGAGATATTTTCA  
6BSP TGTTTTGGGCAGATGGTGTTACAGTCTTTAGGACAAGTAAAAGGTCATGAGATATTTTCA  
19AH TGTTTTGGGCAGATGGTGTTACAGTCTTTAGGACAAGTAAAAGGTCATGAGATATTTTCA  
23FPO TGTTTTGGACAGATGGTGTTGCAGTCTCTTGGACAGGTGAAAGGTCATGCTACATTTGTG  
19FTW TGTTTTGGACAGATGGTGTTGCAGTCTCTTGGACAGGTGAAAGGTCATGCTACATTTGTG  
9VSP TGTTTTGGACAGATGGTGTTGCAGTCTCTTGGACAGGTGAAAGGTCATGCTACATTTGTG  
TIGR4 TGTTTTGGACAGATGGTGTTGCAGTCTCTTGGACAGGTGAAAGGTCATGCTACATTTGTG  
23FTW TGTTTTGGGCAGATGGTGTTACAGTCTTTAGGACAAGTAAAAGGTCATGAGATATTTTCA  
\*\*\*\*\*

14CSR GAATCTGTGACGGCCGACAGTTACCAAGAGCAATTGCAACGGTCGCTTGATTACAATCAA  
670 GAATCTGTGACGGCCGACAGTTACCAAGAGCAATTGCAACGGTCGCTTGATTACAATCAA  
6BF GAATCTGTGACGGCCGACAGTTACCAAGAGCAATTGCAACGGTCGCTTGATTACAATCAA  
6BSP GAATCTGTGACGGCCGACAGTTACCAAGAGCAATTGCAACGGTCGCTTGATTACAATCAA  
19AH GAATCTGTGACGGCCGACAGTTACCAAGAGCAATTGCAACGGTCGCTTGATTACAATCAA  
23FPO AAATCCATGACAACCTGAAATGTACCAAGAACAACAGAACCATTCTCTCGCCTACAATCAA  
19FTW AAATCCATGACAACCTGAAATGTACCAAGAACAACAGAACCATTCTCTCGCCTACAATCAA  
9VSP AAATCCATGACAACCTGAAATGTACCAAGAACAACAGAACCATTCTCTCGCCTACAATCAA  
TIGR4 AAATCCATGACAACCTGAAATGTACCAAGAACAACAGAACCATTCTCTCGCCTACAATCAA  
23FTW GAATCTGTGACGGCCGACAGTTACCAAGAGCAATTGCAACGGTCGCTTGATTACAATCAA  
\*\*\*\*\*

Figure 196AJ

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14CSR CGCTTGGATTTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT  
670 CGCTTGGATTTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT  
6BF CGCTTGGATTTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT  
6BSP CGCTTGGATTTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT  
19AH CGCTTGGATTTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT  
23FPO CGCTTGGCTTCGCAAAATCGCATTGTAGATCCTTTTTTGGCGGAGGGATATGAGGTCAAT  
19FTW CGCTTGGCTTCGCAAAATCGCATTGTAGATCCTTTTTTGGCGGAGGGATATGAGGTCAAT  
9VSP CGCTTGGCTTCGCAAAATCGCATTGTAGATCCTTTTTTGGCGGAGGGATATGAGGTCAAT  
TIGR4 CGCTTGGCTTCGCAAAATCGCATTGTAGATCCTTTTTTGGCGGAGGGATATGAGGTCAAT  
23FTW CGCTTGGATTTCGCAAAATCGTATTGTAGATCCTTTTTTGGCGGAAGGGTATGAGGTAAAT  
\*\*\*\*\*

14CSR TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGA  
670 TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGA  
6BF TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGA  
6BSP TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGA  
19AH TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGA  
23FPO TACCAAGTGTCTGACGACCCTGATGCAGTCTATGGTTACTTGTCTATTCCAAGTTTGGA  
19FTW TACCAAGTGTCTGACGACCCTGATGCAGTCTATGGTTACTTGTCTATTCCAAGTTTGGA  
9VSP TACCAAGTGTCTGACGACCCTGATGCAGTCTATGGTTACTTGTCTATTCCAAGTTTGGA  
TIGR4 TACCAAGTGTCTGACGACCCTGATGCAGTCTATGGTTACTTGTCTATTCCAAGTTTGGA  
23FTW TACCAAGTGTCTGACGATCCTGATGCAGTCTACGGCTATTTGTCGATTCCGAGTTTGGA  
\*\*\*\*\*

14CSR ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT  
670 ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT  
6BF ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT  
6BSP ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT  
19AH ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT  
23FPO ATCATGGAGCCGTTTATTTGGGAGCAGATTATCATCATTTAGGGATGGGCTTGGCTCAT  
19FTW ATCATGGAGCCGTTTATTTGGGAGCAGATTATCATCATTTAGGGATGGGCTTGGCTCAT  
9VSP ATCATGGAGCCGTTTATTTGGGAGCAGATTATCATCATTTAGGGATGGGCTTGGCTCAT  
TIGR4 ATCATGGAGCCGTTTATTTGGGAGCAGATTATCATCATTTAGGGATGGGCTTGGCTCAT  
23FTW ATCATGGAGCCAGTTTATCTAGGAGCGGATTACCATCATTTAGCAATGGGGTTGGCCCAT  
\*\*\*\*\*

14CSR GTGGATGGGACGCCTCTTCCTGTTGAGGGAAAAGGGATTTCGTTCAAGTGATTGCTGGGCAC  
670 GTGGATGGGACGCCTCTTCCTGTTGAGGGAAAAGGGATTTCGTTCAAGTGATTGCTGGGCAC  
6BF GTGGATGGGACGCCTCTTCCTGTTGAGGGAAAAGGGATTTCGTTCAAGTGATTGCTGGGCAC  
6BSP GTGGATGGGACGCCTCTTCCTGTTGAGGGAAAAGGGATTTCGTTCAAGTGATTGCTGGGCAC  
19AH GTGGATGGGACGCCTCTTCCTGTTGAGGGAAAAGGGATTTCGTTCAAGTGATTGCTGGGCAC  
23FPO GTGGATGGTACACCGCTGCCTCTGGATGGTACAGGGATTTCGCTCAGTGATTGCTGGGCAC  
19FTW GTGGATGGTACACCGCTGCCTCTGGATGGTACAGGGATTTCGCTCAGTGATTGCTGGGCAC  
9VSP GTGGATGGTACACCGCTGCCTCTGGATGGTACAGGGATTTCGCTCAGTGATTGCTGGGCAC  
TIGR4 GTGGATGGTACACCGCTGCCTCTGGATGGTACAGGGATTTCGCTCAGTGATTGCTGGGCAC  
23FTW GTGGATGGGACGCCTCTTCCTGTTGAGGGAAAAGGGATTTCGTTCAAGTGATTGCTGGGCAC  
\*\*\*\*\*

14CSR CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT  
670 CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT  
6BF CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT  
6BSP CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT  
19AH CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT  
23FPO CGTGCAGAGCCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT  
19FTW CGTGCAGAGCCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT  
9VSP CGTGCAGAGCCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT  
TIGR4 CGTGCAGAGCCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT  
23FTW CGTGCAGAACCAAGCCATGTCTTTTTCCGCCATTTGGATCAGCTAAAAGTTGGAGATGCT  
\*\*\*\*\*

Figure 196AK



PCT/US2005/027239

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14CSR CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT  
670 CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT  
6BF CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT  
6BSP CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT  
19AH CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT  
23FPO CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT  
19FTW CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT  
9VSP CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT  
TIGR4 CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT  
23FTW CTTTATTATGATAATGGCCAGGAAATTGTAGAATATCAGATGATGGACACAGAGATTATT  
\*\*\*\*\*

14CSR TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA  
670 TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA  
6BF TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA  
6BSP TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA  
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23FPO TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA  
19FTW TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA  
9VSP TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA  
TIGR4 TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA  
23FTW TTACCGTCGGAATGGGAAAAATTAGAATCGGTTAGCTCTAAAAATATCATGACCTTGATA  
\*\*\*\*\*

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670 ACCTGCGATCCGATTCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT  
6BF ACCTGCGATCCGATTCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT  
6BSP ACCTGCGATCCGATTCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT  
19AH ACCTGCGATCCGATTCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT  
23FPO ACCTGCGATCCGATTCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT  
19FTW ACCTGCGATCCGATTCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT  
9VSP ACCTGCGATCCGATTCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT  
TIGR4 ACCTGCGATCCGATTCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT  
23FTW ACCTGCGATCCGATTCTACCTTTAATAAACGCTTATTAGTGAATTTTGAACGAGTCGCT  
\*\*\*\*\*

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670 GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA  
6BF GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA  
6BSP GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA  
19AH GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA  
23FPO GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA  
19FTW GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA  
9VSP GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA  
TIGR4 GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA  
23FTW GTTTATCAAAAATCAGATCCACAAACAGCTGCAGTTGCGAGGGTTGCTTTTACGAAAGAA  
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14CSR GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG  
670 GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG  
6BF GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG  
6BSP GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG  
19AH GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG  
23FPO GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG  
19FTW GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG  
9VSP GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG  
TIGR4 GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG  
23FTW GGACAATCTGTATCGCGTGTGCAACCTCTCAATGGTTGTACCGTGGGCTAGTGGTACTG  
\*\*\*\*\*

Figure 196AL

PCT/US05/27239

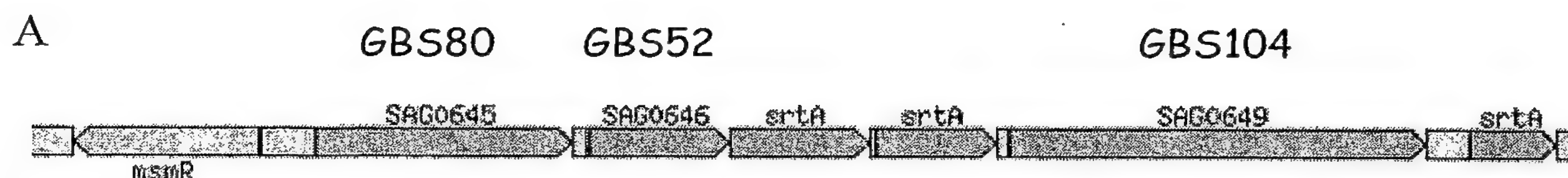
431/487

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670	GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
6BF	GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
6BSP	GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
19AH	GCATTTATGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
23FPO	GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
19FTW	GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
9VSP	GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
TIGR4	GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
23FTW	GCATTTCTGGGAATCCTGTTTGTGTTTGTGGAAGCTAGCACGTTTACTACGAGGGAAATAA
	*****
14CSR	AAAGAAATGAAAGGAAAGCTAAGGCTGTTTCCTTTTTCCGGCTCTTTGTCAACTGTAGGGG
670	AAAGAAATGAAAGGAAAGCTAAGGCTGTTTCCTTTTTCCGGCTCTTTGTCAACTGTAGTGG
6BF	AAAGAAATGAAAGGAAAGCTAAGGCTGTTTCCTTTTTCCGGCTCTTTGTCAACTGTAG---
6BSP	AAAGAAATGAAAGGAAAGCTAAGGCTGTTTCCTTTTTCCGGCTCTTTGTCAACTGTAG---
19AH	AAAGAAATGAAAGGAAAGCTAAGGCTGTTTCCTTTTTCCGGCTCTTTGTCAACTGTAG---
23FPO	AAAGAAATGAAAGGAAAGCTAAGGCTGTTTCCTTTTTCCGGCTCTTTGTCAACTGT-----
19FTW	AAAGAAATGAAAGGAAAGCTAAGGCTGTTTCCTTTTTCCGGCTCTTTGTCAACTGTAGT--
9VSP	AAAGAAATGAAAGGAAAGCTAAGGCTGTTTCCTTTTTCCGGCTCTTTGTCAACTGTAG---
TIGR4	AAAGAAATGAAAGGAAAGCTAAGGCTGTTTCCTTTTTCCGGCTCTTTGTCAACTGTAGTGG
23FTW	AAAGAAATGAAAGGAAAGCTAAGGCTGTTTCCTTTTTCCGGCTCTTTGTCAACTGTA----
	*****

Figure 196AM



Figure 197



B

**Intergenic region between AraC R and GBS 80**

**AraC...CAT**

TTGATAGACCGCCTTCATTATCATTTCTAGAATTTTTCTTTAGGTTTGTA  
AAGACTACAAAATAAAAATGATGAAAACAACATCTTGTGGATACACTAAA  
AAGACACGCTAATTAGCAAACCTCTCTCTTCATCATCTCTCACCATTATTA  
TACTAC **TATTTATAT**GACAAATAAAGGT**G**ATTT **TGTTAA**AATATACTTT  
GAAAATCCACATATATTTTAAATCTTCCGTCTG**AAAAAA**TAAATAAAAAT  
AGTAAAAATAAACACGAATTTAAAATAAGCAAATTTTTTAAGAAAATCTG  
TGCTAAACTTTAATAGTTTTGTGCTTAATAATAATCAGCACTTACAAAGA  
ACAAAGGGGAAAAGCGAG**GGAGAG**AACTTTTA **ATG... GBS80**

C

187	4A		5A		5A
233	6A		6A		7A
Strain	FACS α -80	Strain	FACS α -80	Strain	FACS α -80
1998	95	5364	<b>454</b>	2129	57
2110	0	JMV071	<b>556</b>	2274	113
2603	62	JM91003	<b>587</b>	5401	170
3050	43	CJB111	<b>365</b>	5408	0
5376	165			5518	31
M781	65			CJB110	71
COH1	<b>305</b> (G→T 179)			J7357B	91
18rs 21	0 (STOP, no LPXTG)			COH31	0

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AI-1											
			aa	M1	M3	M5	M18	M49	M6	M12	
M6											
50913503	M6_Spy0157	LPXTG	628	gas15 30%in593aa	M3-0098 46%in256aa M3-0104 28%in563aa		M18-0132 24%in701aa			M12-4134 74%in703aa	Fibronecti n-binding protein (protein F)
50913505	M6_Spy0159	LPXSG	1037		M3-0104 25%in339aa					M12-4141 37%in98aa	Collagen adhesion protein
50913506	M6_Spy0160	LPXTG	557								Fimbrial structural subunit

Figure 198



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AI-2										
			aa	M1	M3	M5	M18	M49	M6	M12
M1										
gas15	gas15	VVXTG	762		M3-0098 50%in738aa	M5-orf78 60%in462aa	M18-0126 54%in469aa			M12-4135 54%in747aa
13621428	SPY0128 gas16	EVXTG	340		M3-0100 40%in354aa	M5-orf80 41%in358aa	M18-0128 38%in357aa			M12-4137 40%in354aa
13621430	SPY0130 gas18	LPXTG	215		M3-0102 32%200aa	M5-orf82 31%in213aa	M18-0130 32%in213aa			M12-4139 31%in206aa
										Cpa
										hypothetic al protein (fimbrial)
										hypothetic al protein

Figure 199

AI-3											
			aa	M1	M3	M5	M18	M49	M6	M12	
M3											
21909634	SpyM3_0098	VPXTG	744	gas15 51%in739aa		M5-orf78 58%in484aa	M18-0126 74%in482aa			M12-4135 55%in751aa	putative collagen binding protein (Cpb)
21909636	SpyM3_0100	QVXTG	344	gas16 40%in354aa		M5-orf80 64%in349aa	M18-0128 67%in345aa			M12-4137 61%in344aa	conserved hypothetical al protein (fimbrial)
21909638	SpyM3_0102	LPXAG	195	gas18 32%in200aa		M5-orf82 98%in183aa	M18-0130 97%in183aa			M12-4139 99%in183aa	hypothetical al protein
21909640	SpyM3_0104	LPXTG	696			M5-orf84 88%in656aa	M18-0132 88%in656aa			M12-4141 59%in612aa	protein F2 like fibronectin-binding

Figure 200A



Figure 200B

Figure 200B

Figure 200C

Figure 200C



M49												
56808848	VPXTG	744	gas15 55%in738aa	M3-0098 72%in743aa	M5-orf78 78%in483	M18-0126 61% in484				M12-4135 73%in752aa	putative collagen binding protein (Cpb)	
56808846	QVXTG	344	gas16 36%in355aa	M3-0100 66%in345aa	M5-orf80 61%in349aa	M18-0128 90%in344aa				M12-4137 62%in344aa	conserved hypothetic al protein (fimbrial)	
56808844	LPXAG	189	gas18 31%in206aa	M3-102 98%in189aa	M5-orf82 98%in189aa	M18-0130 98%in189aa				M12-4139 98%in189aa	hypothetic al protein	
56808842	LPXTG	1160		M3-104 59%in612aa	M5-orf84 50%in701aa	M18-0132 50%in701aa		M6-0157 32%in296aa	M12-4141 91%in1164aa	protein F2 like fibronectin -binding		

Figure 200D

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AI-4											
			aa	M1	M3	M5	M18	M49	M6	M12	
M12											
19224134		LPXTG	698	gas15 44%in297aa	M3-0098 49%in254aa				M6-0157 74%in703aa		protein F
19224135		VPXTG	756	gas15 54%in747aa	M3-0098 55%in751aa	orf78 80%in484aa	M18-0126 59%in483aa		M6-0157 51%in275aa		Cpa
19224137		QVXTG	342	gas16 40%in354aa	M3-0100 61%in344aa	orf80 65%in384aa	M18-0128 62%in344aa				EflSLA (fimbria)
19224139		LPXAG	189	gas18 31%in206aa	M3-0102 99%in183aa	orf82 98%in189aa	M18-130 97%in189aa				Orf2
19224141		LPXTG	1161		M3-0104 59%in612aa	orf84 50%in701aa	M18-0132 50%in701aa				protein F2

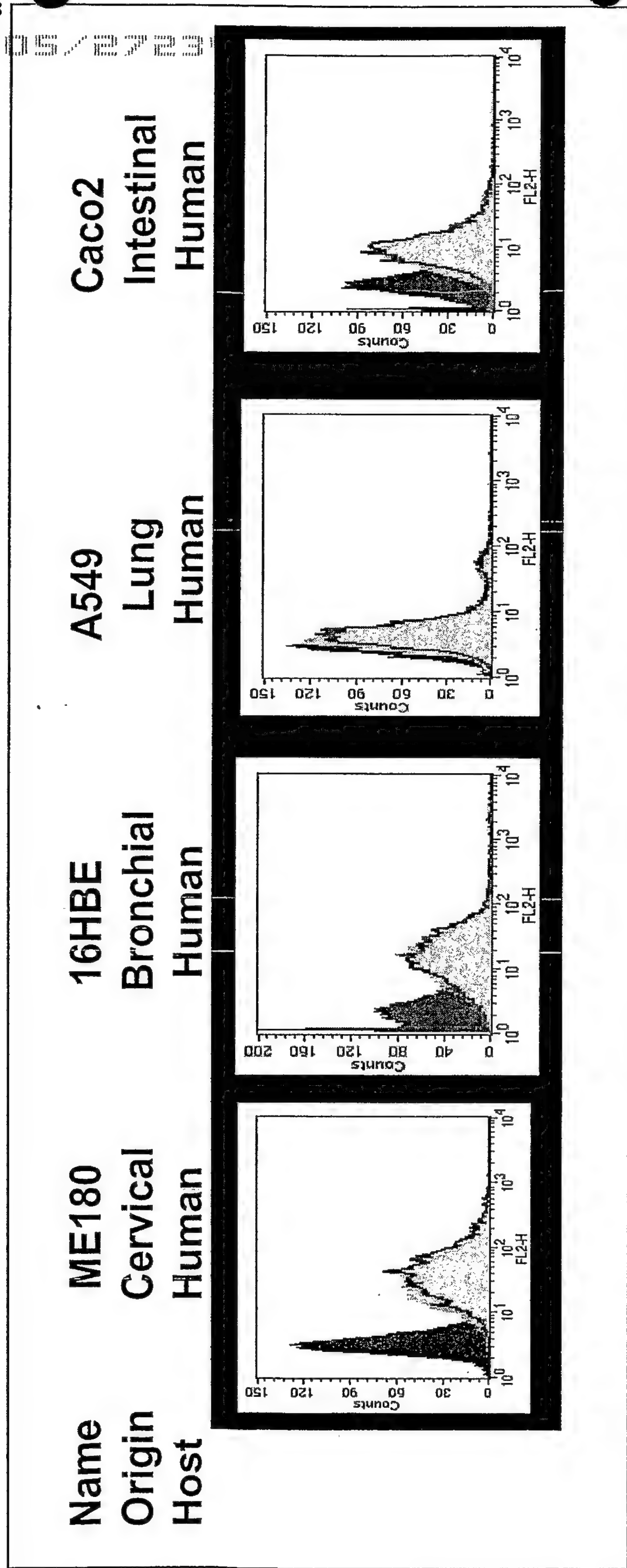
Figure 201



Figure 202

WO 2006/078318  
PCT/US2005/027239

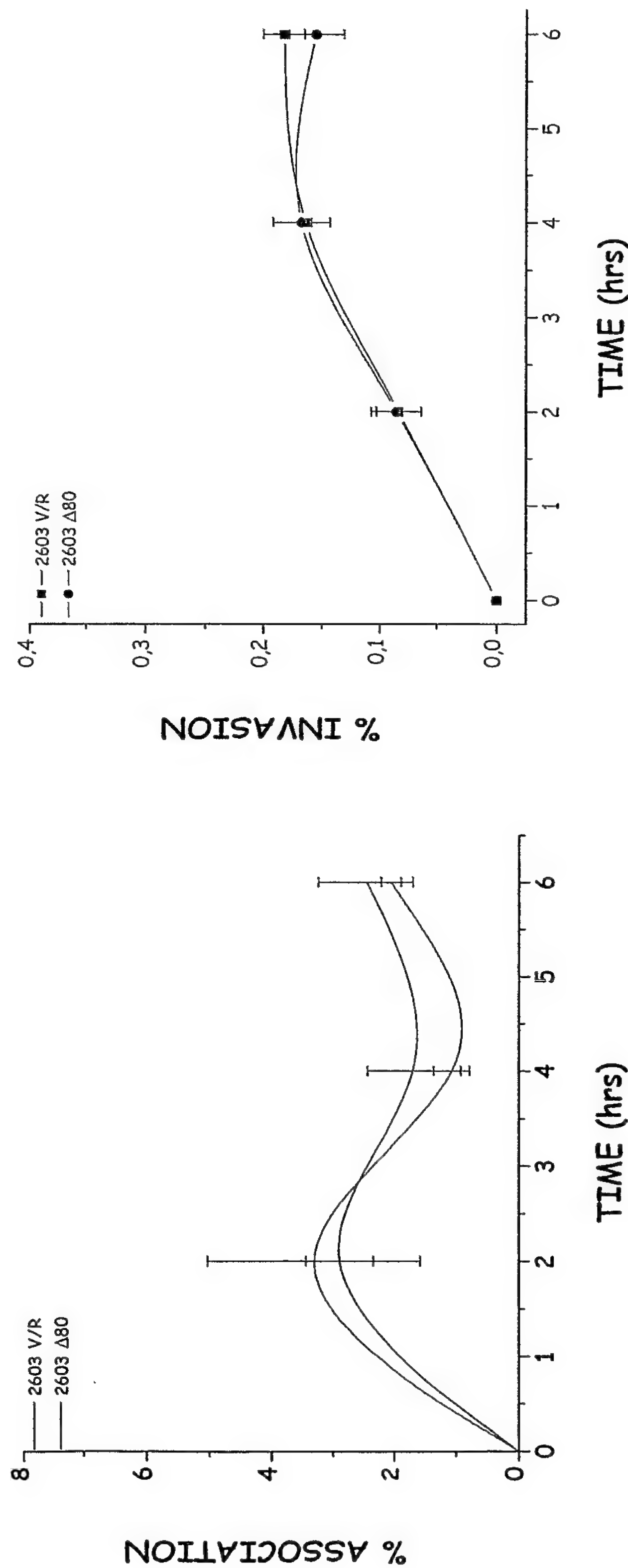
**3S80 recombinant protein does not bind to epithelial cells**



Epithelial cells were incubated in the presence or absence of GBS80 protein and then a mouse a-GBS80 polyclonal antibody added. The cell were then stained with FITC-conjugated a-mouse IgG antibody. The violet area indicates cells treated with FITC-conjugated antibody alone. GBS80 binding, expressed as Dmean channel values, was measured by FACScan cytometer as difference in fluorescence intensity between cell incubated with or without GBS80. The same protocol was used for GBS101 protein binding to epithelial cells

Figure 203

# Deletion of GBS80 protein does not affect the ability of GBS to adhere and invade ME180



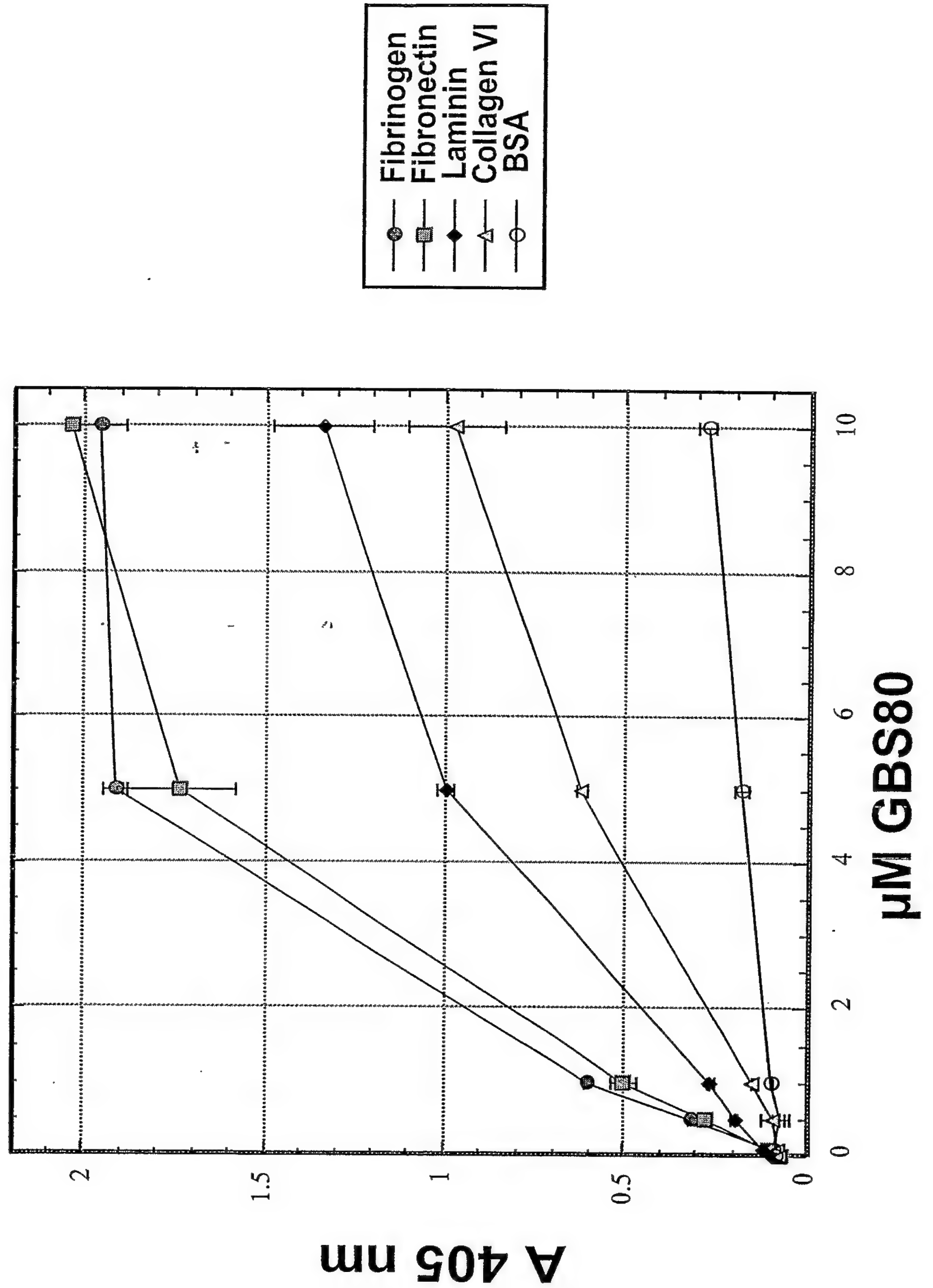
ME180 cervical carcinoma epithelial cells were infected with GBS 2603 wild type or 2603 D80 isogenic mutant. After 2h infection, non-adherent bacteria were washed off and infection prolonged for further 2h and 4h. In invasion experiments, after each time point followed a 2h antibiotic treatment. Cells were then lysed with 1% saponin and lysates plated on TSA plates.



Figure 204

# **GBS80 binds to ECM proteins**

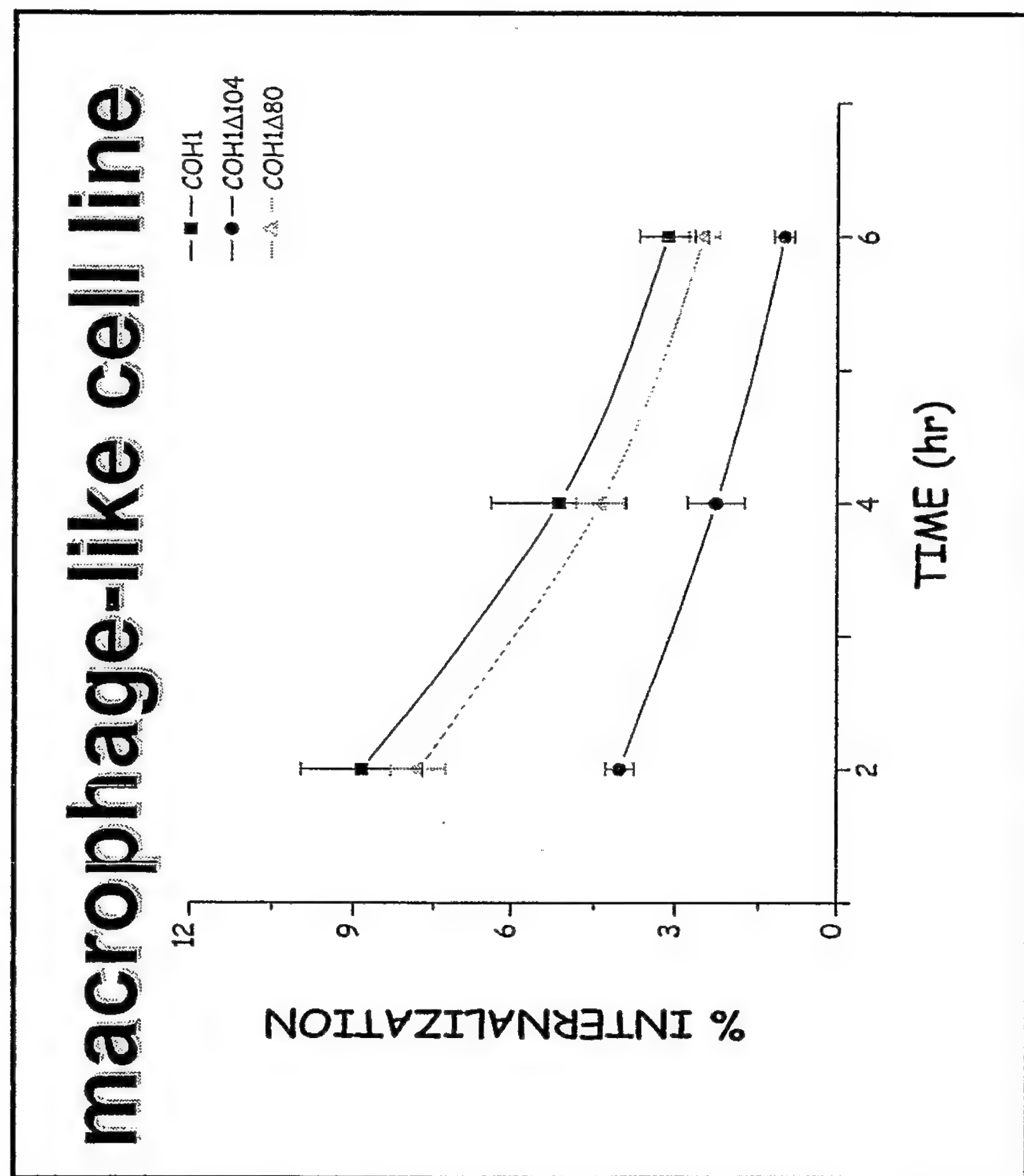
ELISA with purified ECM components and native GBS80 protein



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Figure 205

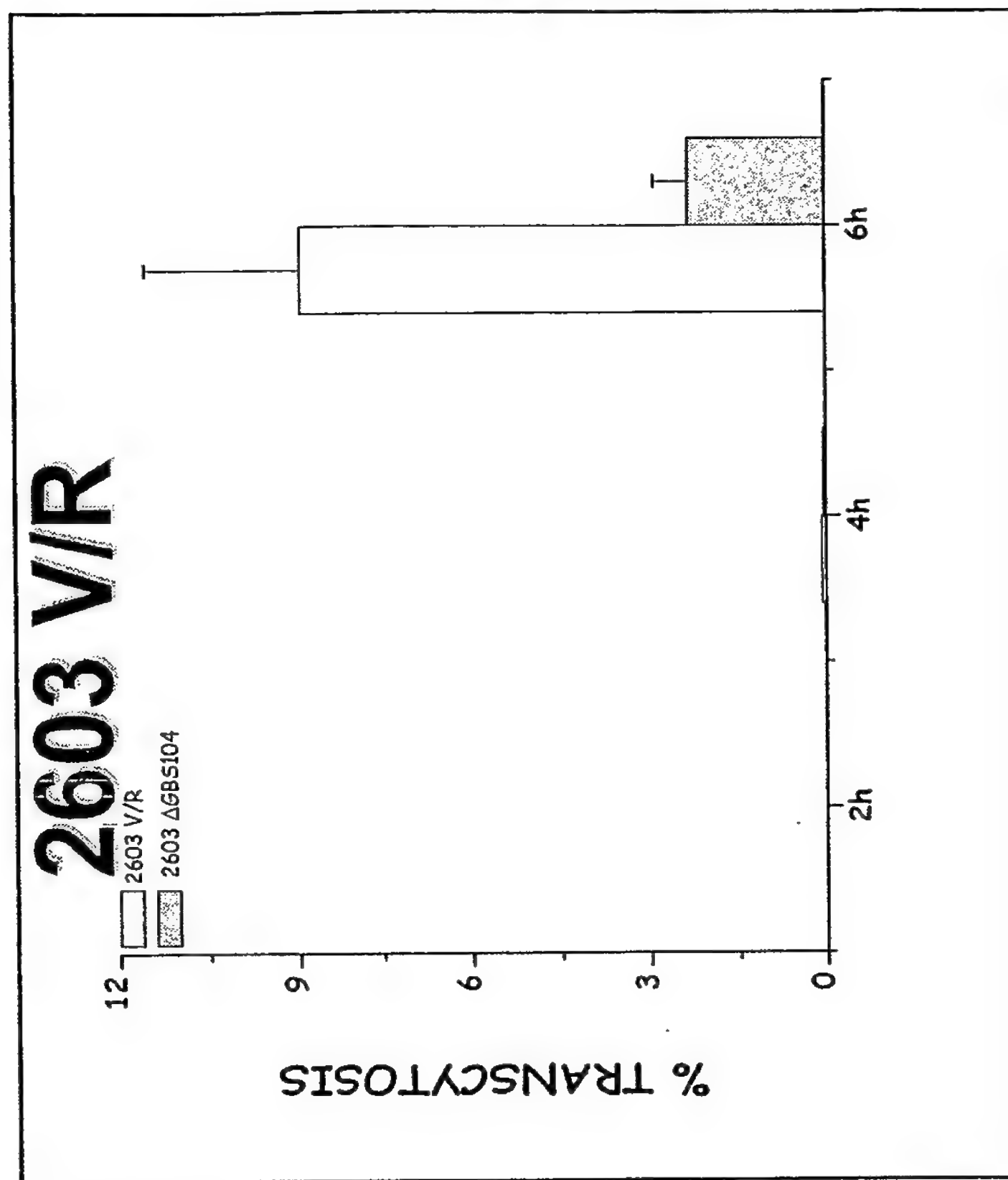
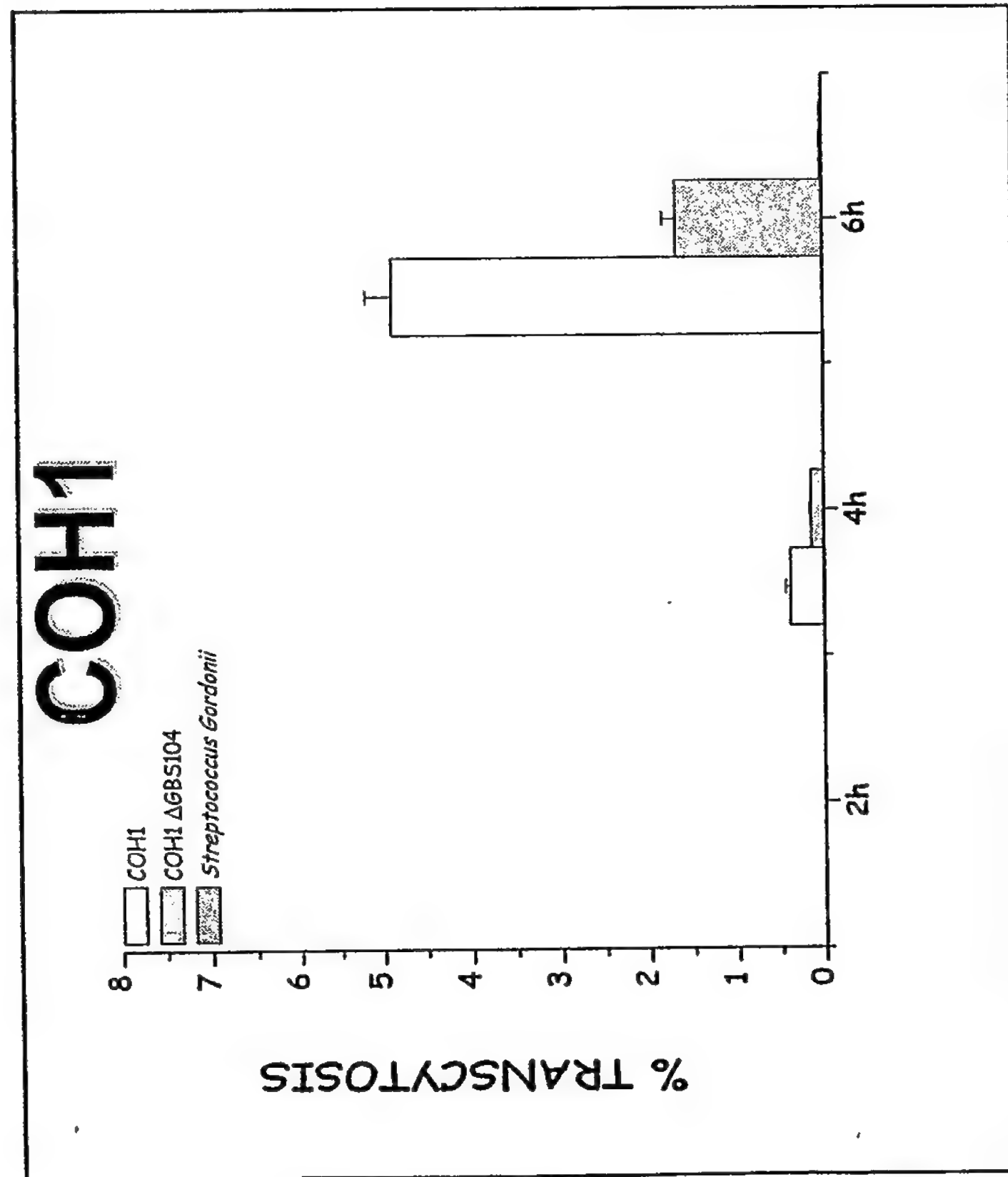
# Deletion of GBS104 protein, but not GBS80, reduces the capacity of GBS to invade J774



J774 cells were infected with GBS COH1 wild type or COH1ΔGBS104/COH1ΔGBS80 isogenic mutants. After 1h infection, non-adherent bacteria were washed off and intracellular bacteria recovered at 2h, 4h and 6h post-antibiotic treatment. At each time point cells were lysed with 0.25% Triton X-100 and

Figure 206

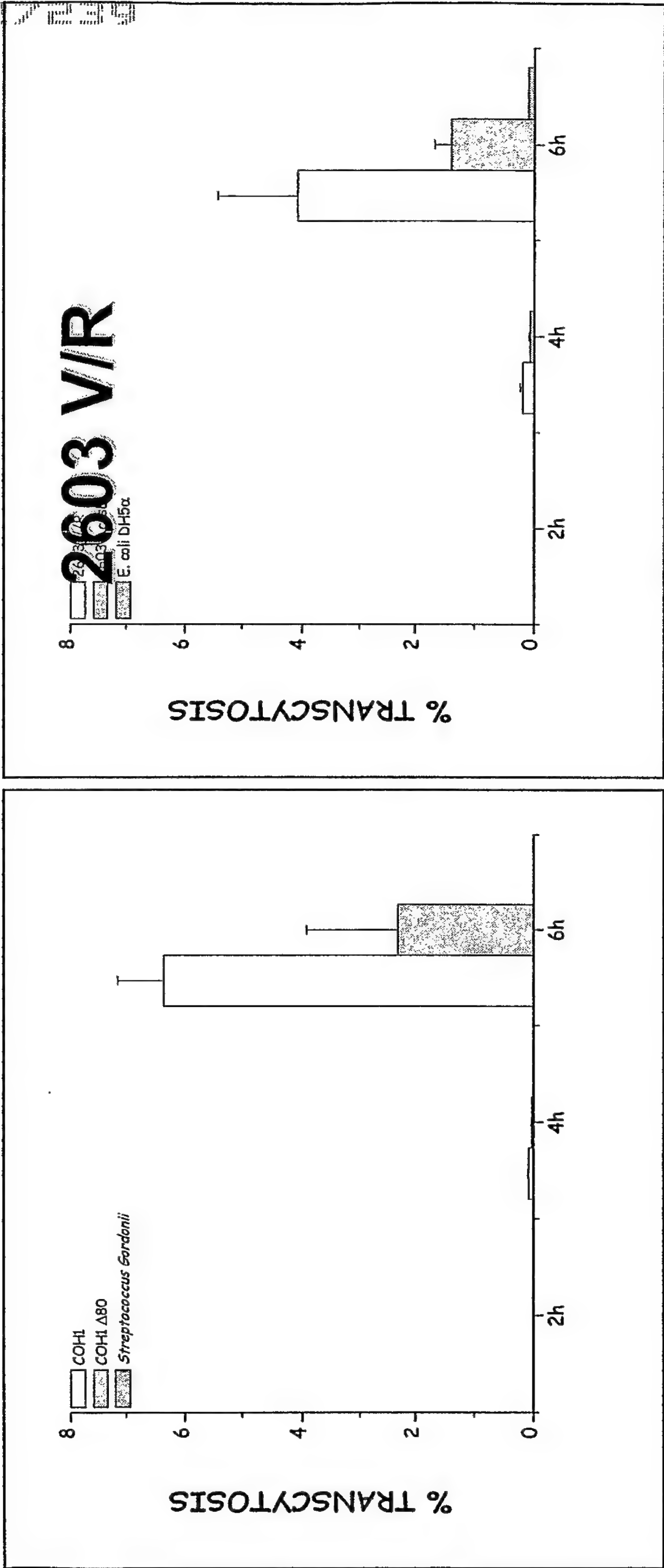
**GBS104 knockout mutant strain translocates  
through an epithelial monolayer less efficiently than  
the isogenic wild type**





# GBS80 knockout mutant strain partially loses the ability to translocate through an epithelial monolayer

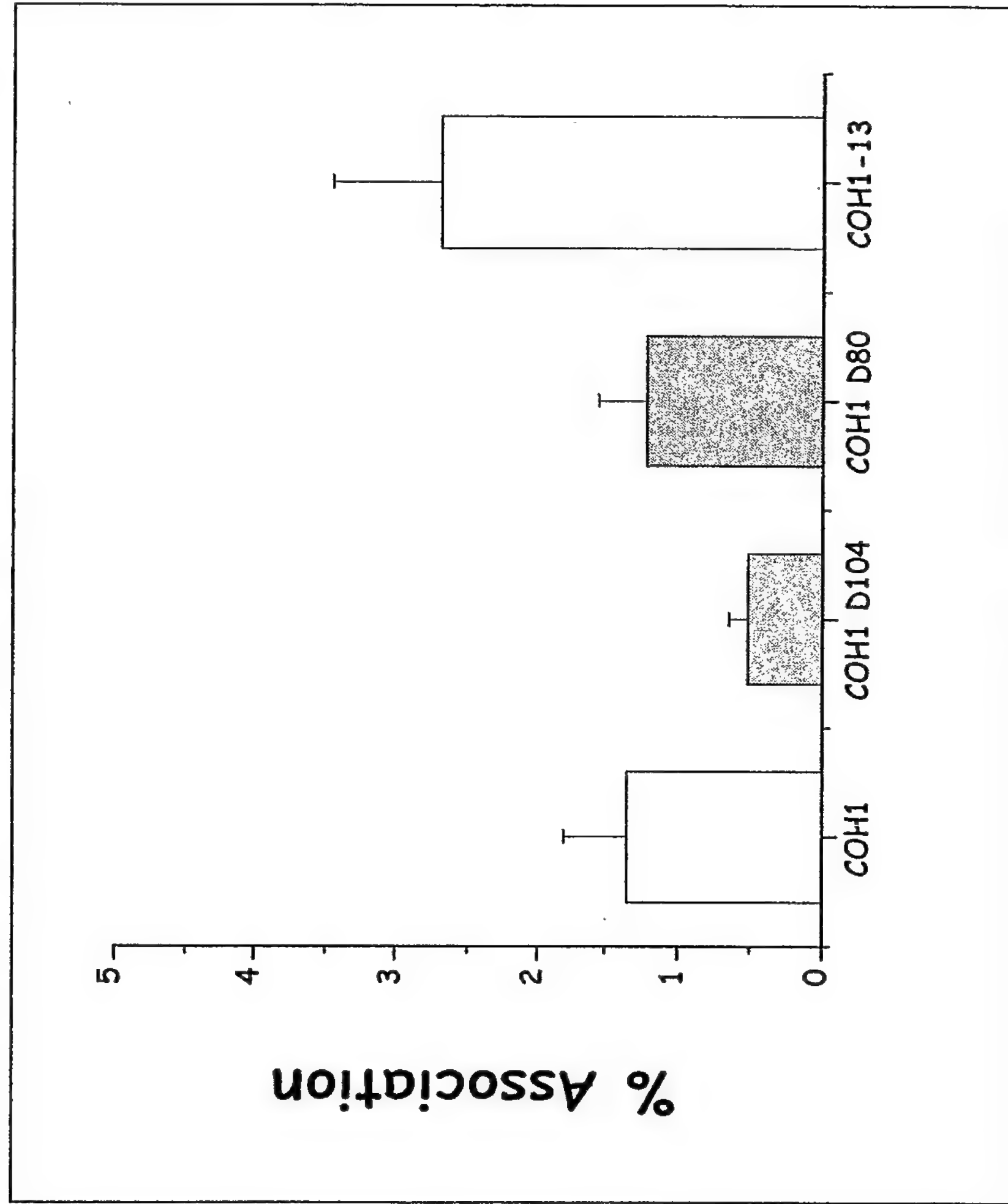
Figure 207



Epithelial cells monolayers were inoculated with each bacterium in the apical chamber of a transwell system for 2h and then non-adherent bacteria washed off. Infection was prolonged for further 2h and 4h. Samples were taken from the media of the basolateral side and the number of colony forming units measured. Transepithelial electrical resistance measured prior and after infection gave comparable values, indicating the maintenance of the integrity of the monolayer.

Figure 208

## GBS adherence to HUVEC endothelial cells



HUVEC cells were infected with GBS COH1 wild type or COH1DGBS104/COH1DGBS80 isogenic mutants. After 1h infection, non-adherent bacteria were washed off and cells lysed with 1% saponin and lysates plated on TSA plates.

Figure 209

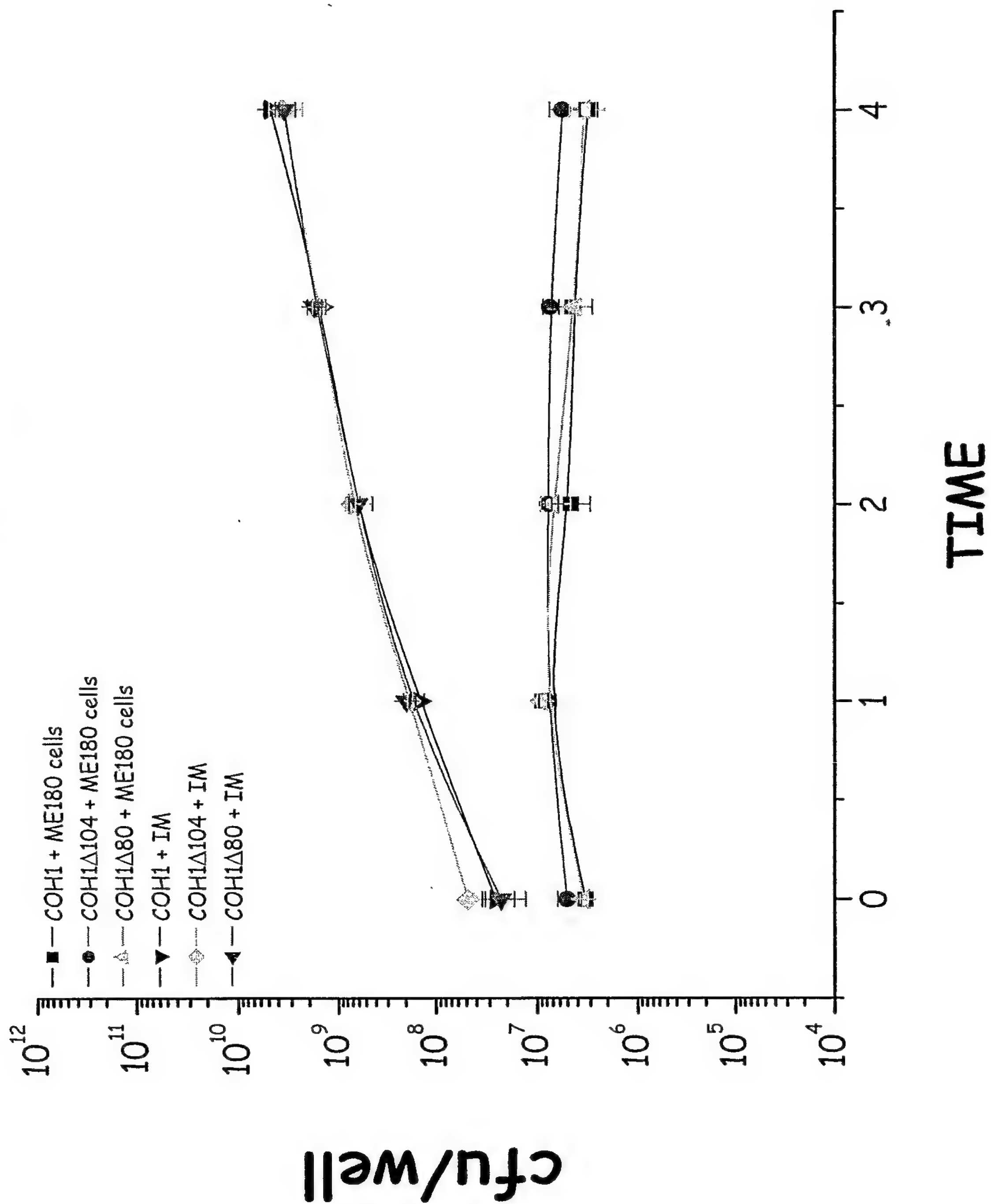




Figure 210

Binding of recombinant GBS104 protein to epithelial cells

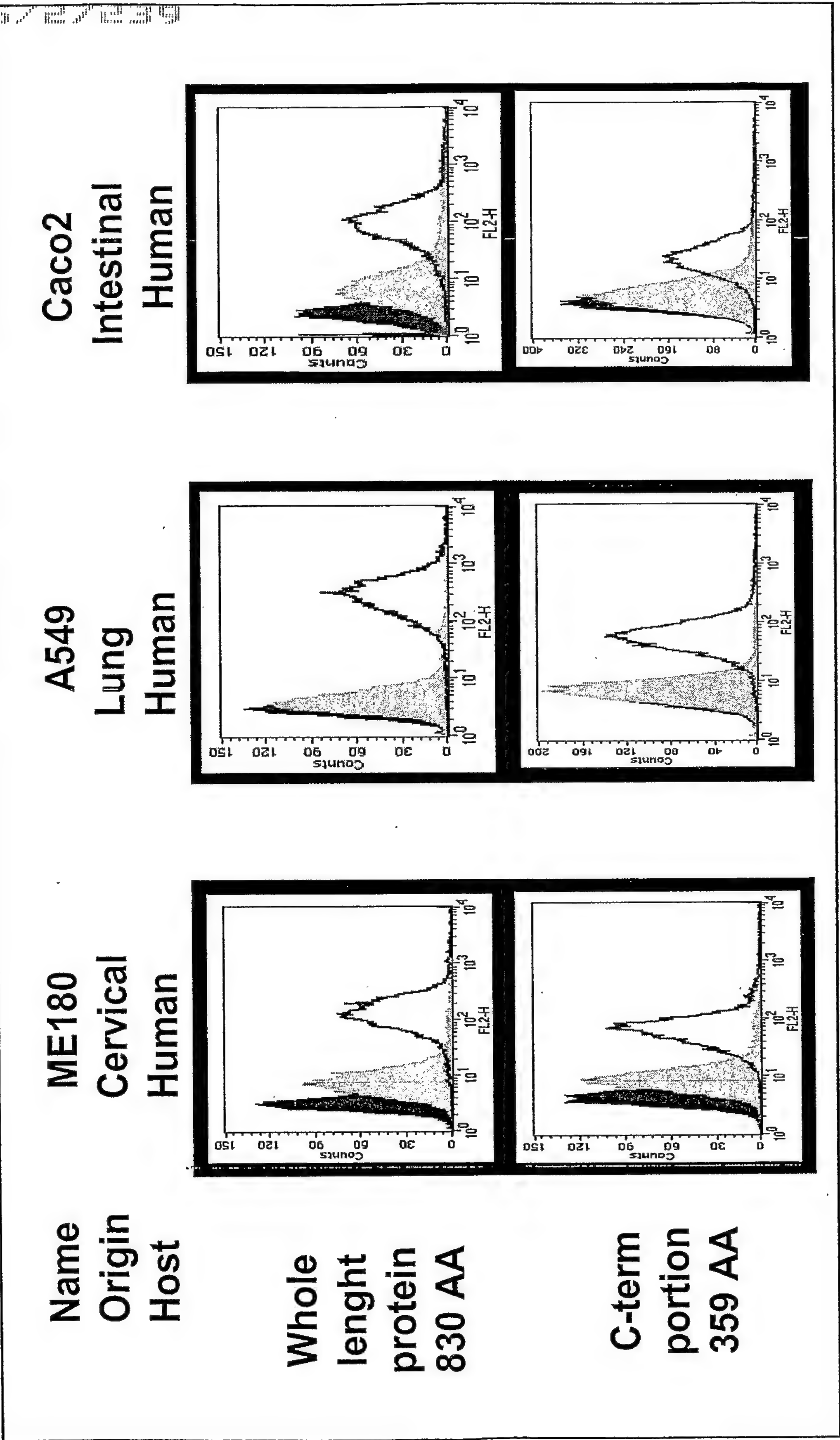
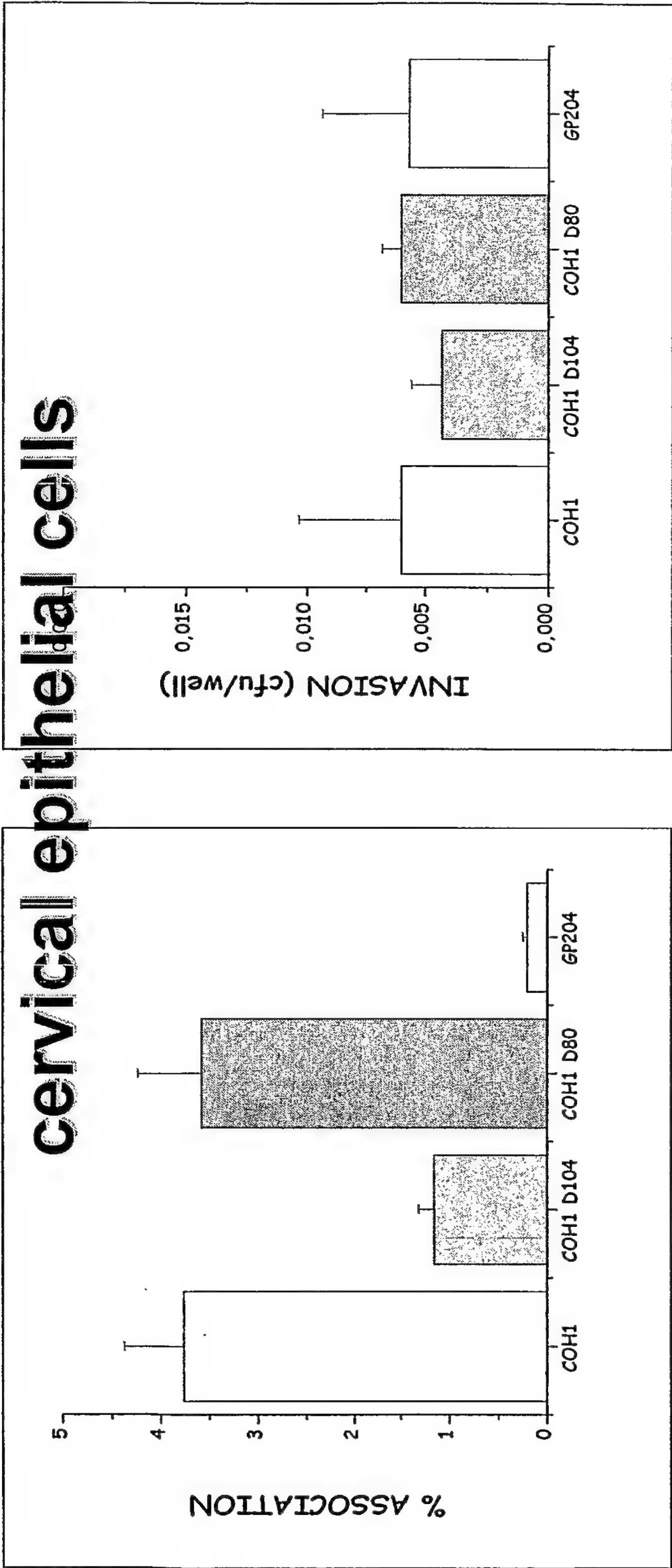


Figure 211

# Deletion of GBS104 protein in the GBS strain COH1 reduces the ability of GBS to adhere to ME180



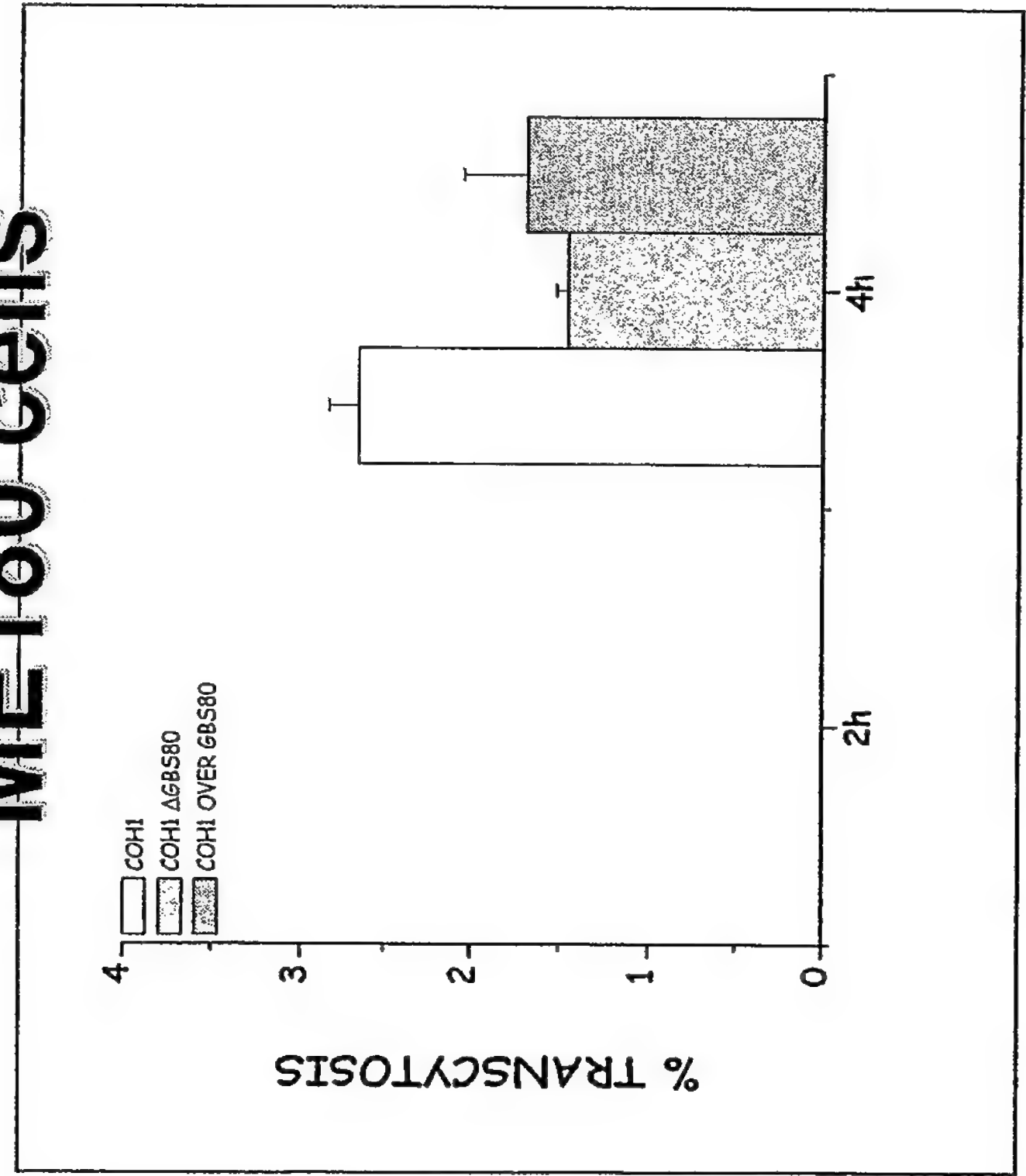
ME180 cervical carcinoma epithelial cells were infected with GBS COH1 wild type or COH1DGBS104/ COH1DGBS80 isogenic mutants. After 1h infection, non-adherent bacteria were washed off and cells lysed with 1% saponin and

luciferase related on TSA plates

Figure 212

# COH1 overexpressing GBS80 protein has an impaired capacity to translocate through an epithelial monolayer

ME180 cells



Caco2 cells

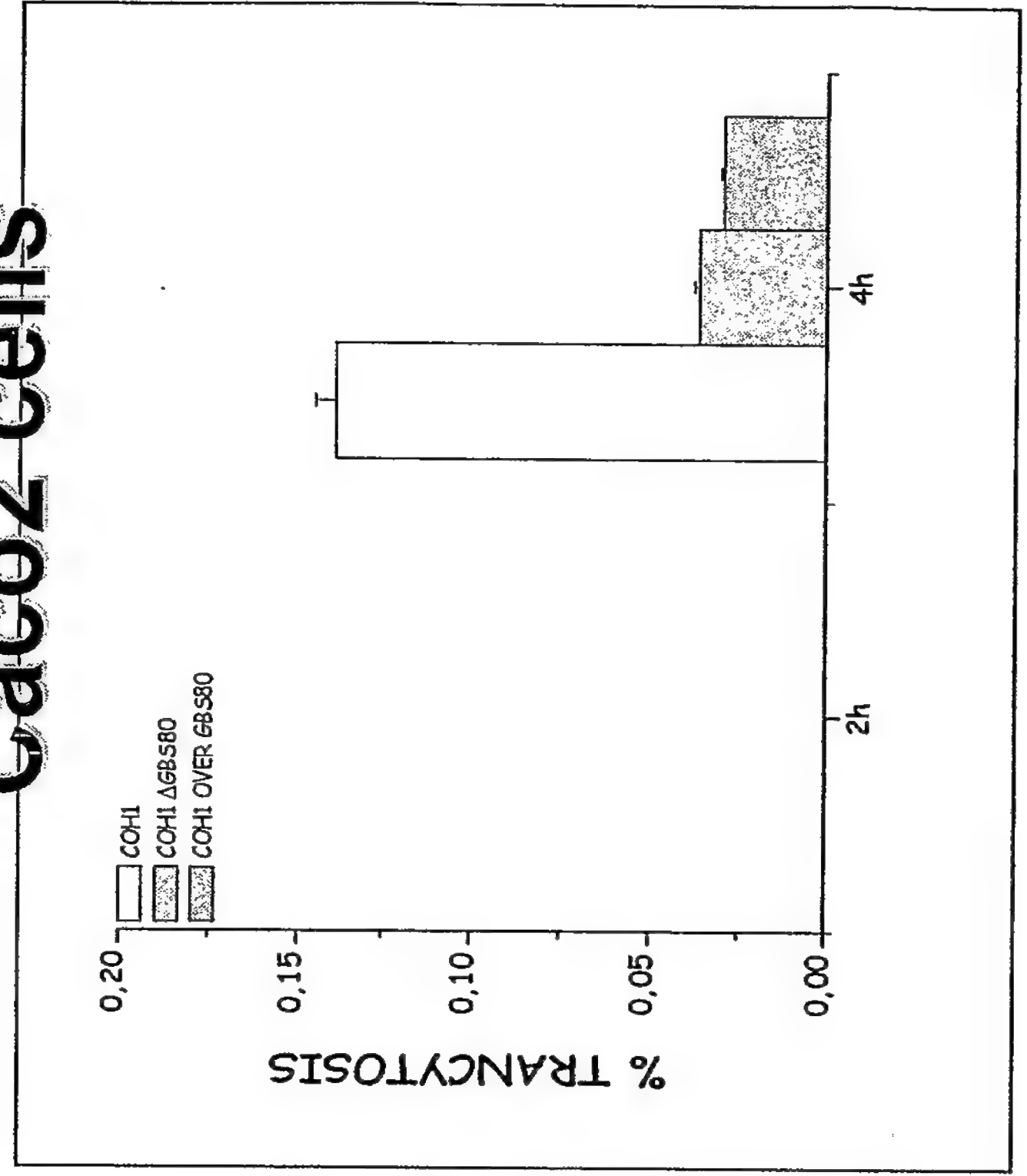
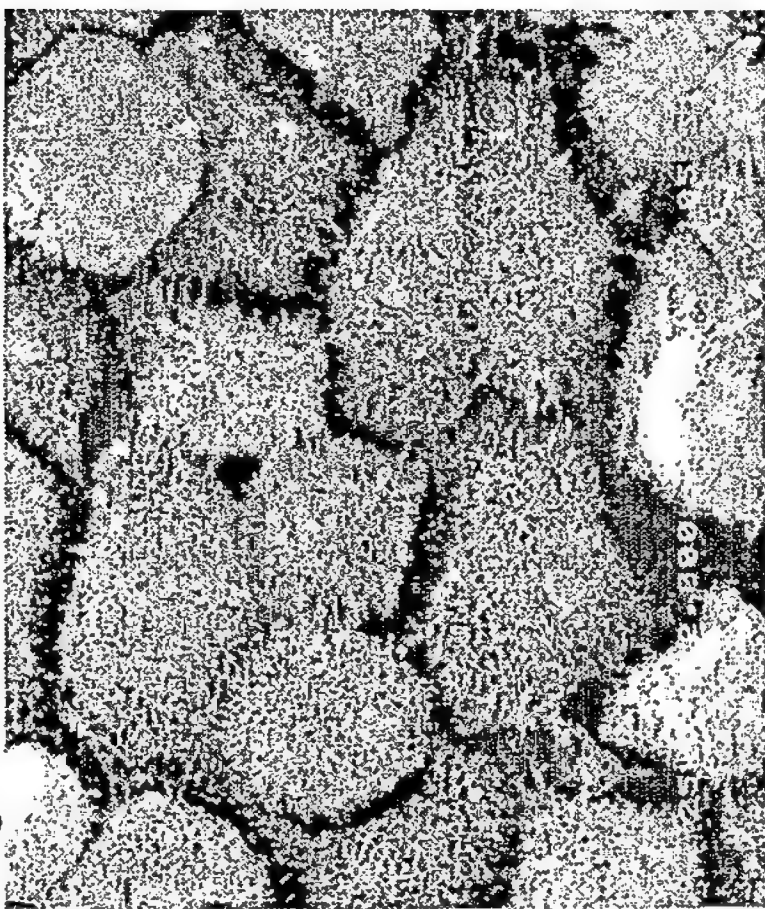




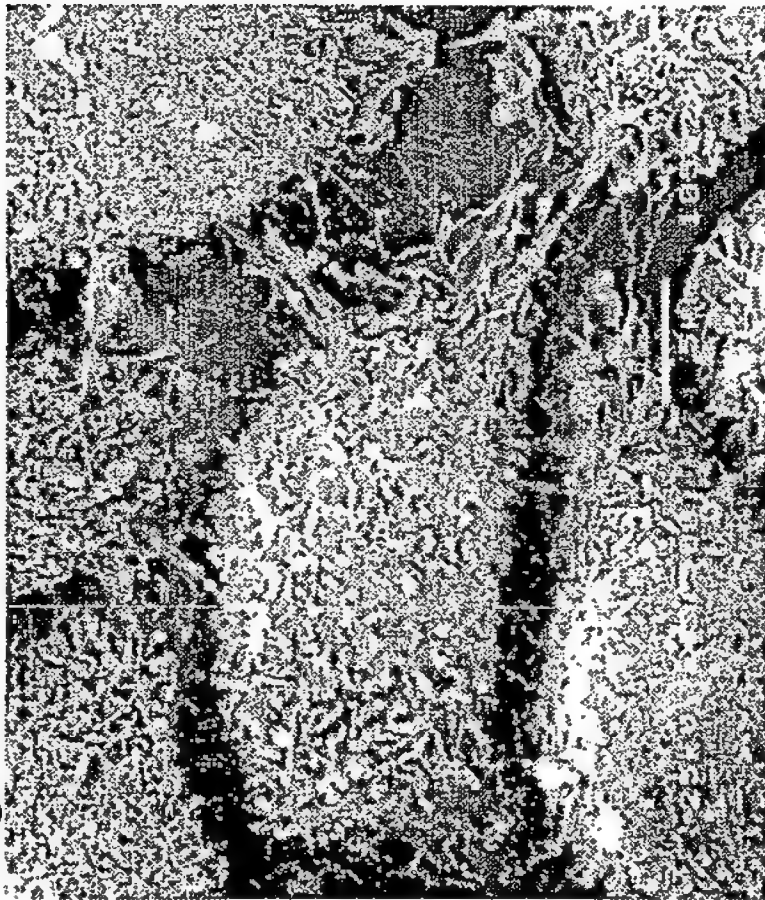
Figure 213

Magnification x2000

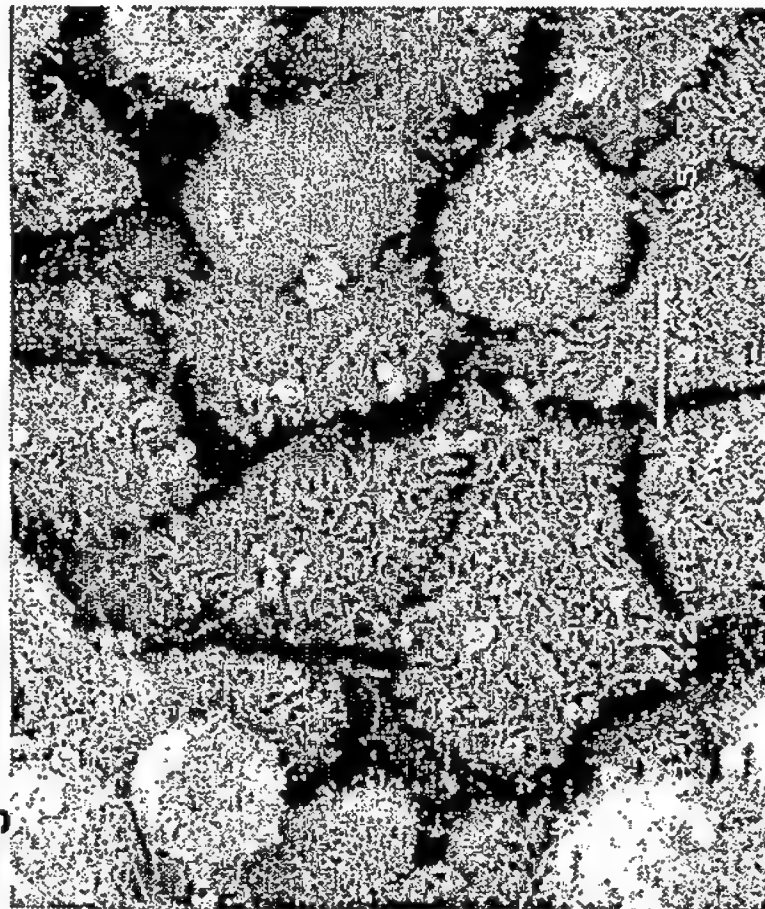


Non-infected ME180 cells  
(SEM)

Magnification x3500

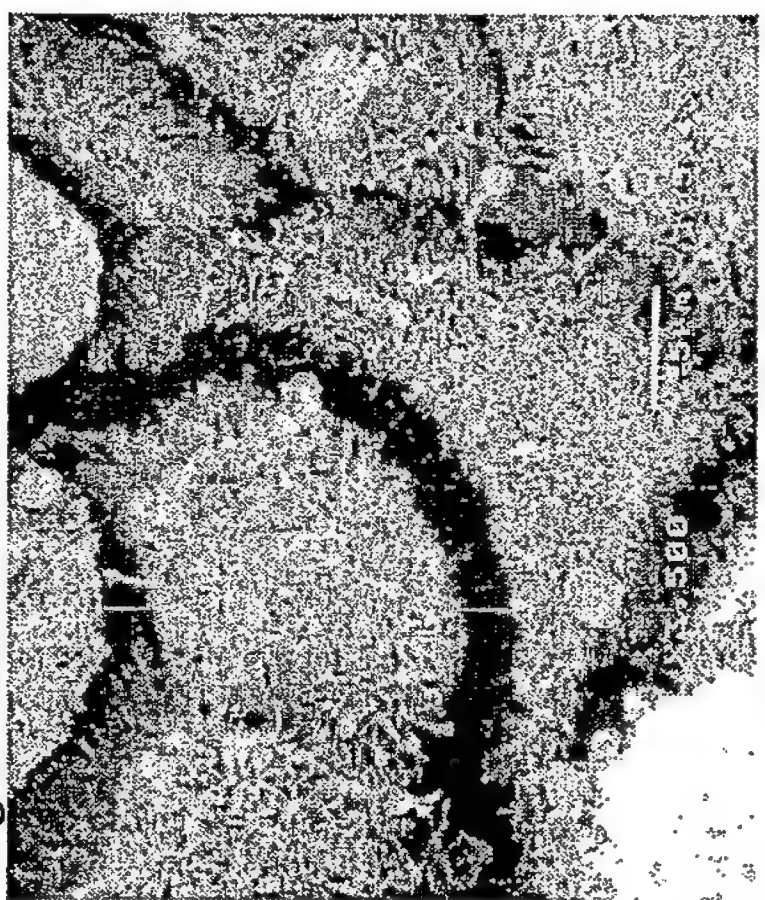


Magnification x2000

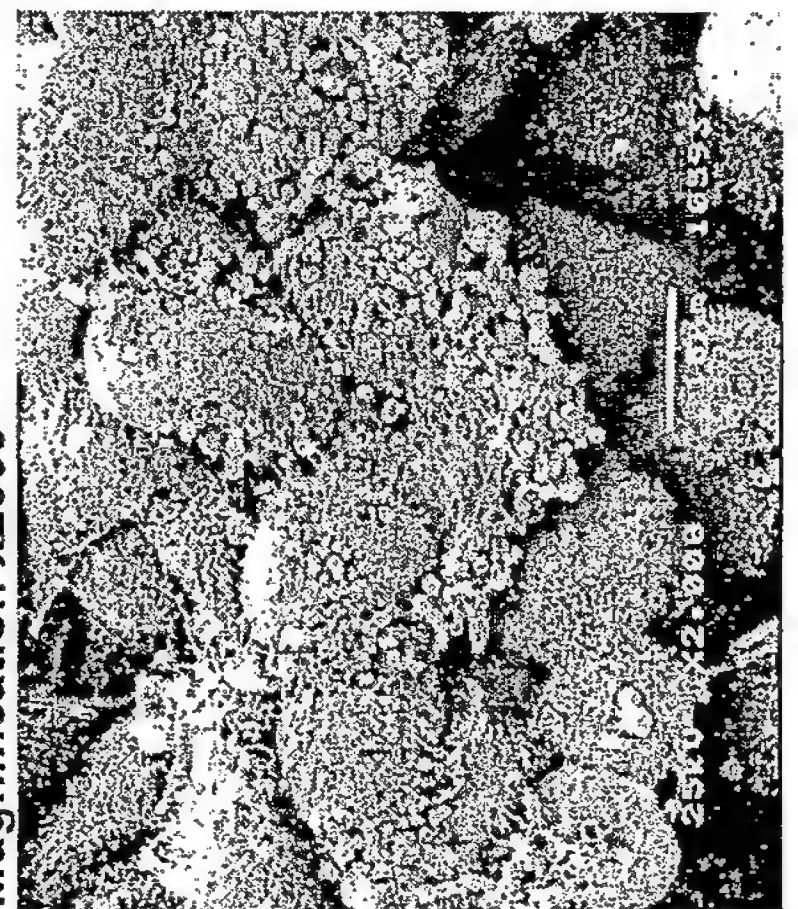


ME180 cells infected with COH1 strain  
(SEM)

Magnification x3500



Magnification x2000



ME180 cells infected with  
COH1 strain  
overexpressing GBS80  
(SEM)

Magnification x3500





Figure 214

OH1 infection of ME180 cells

F-actin Blue

$\alpha$ -serotype III capsule Red

$\alpha$ -GBS80 Green

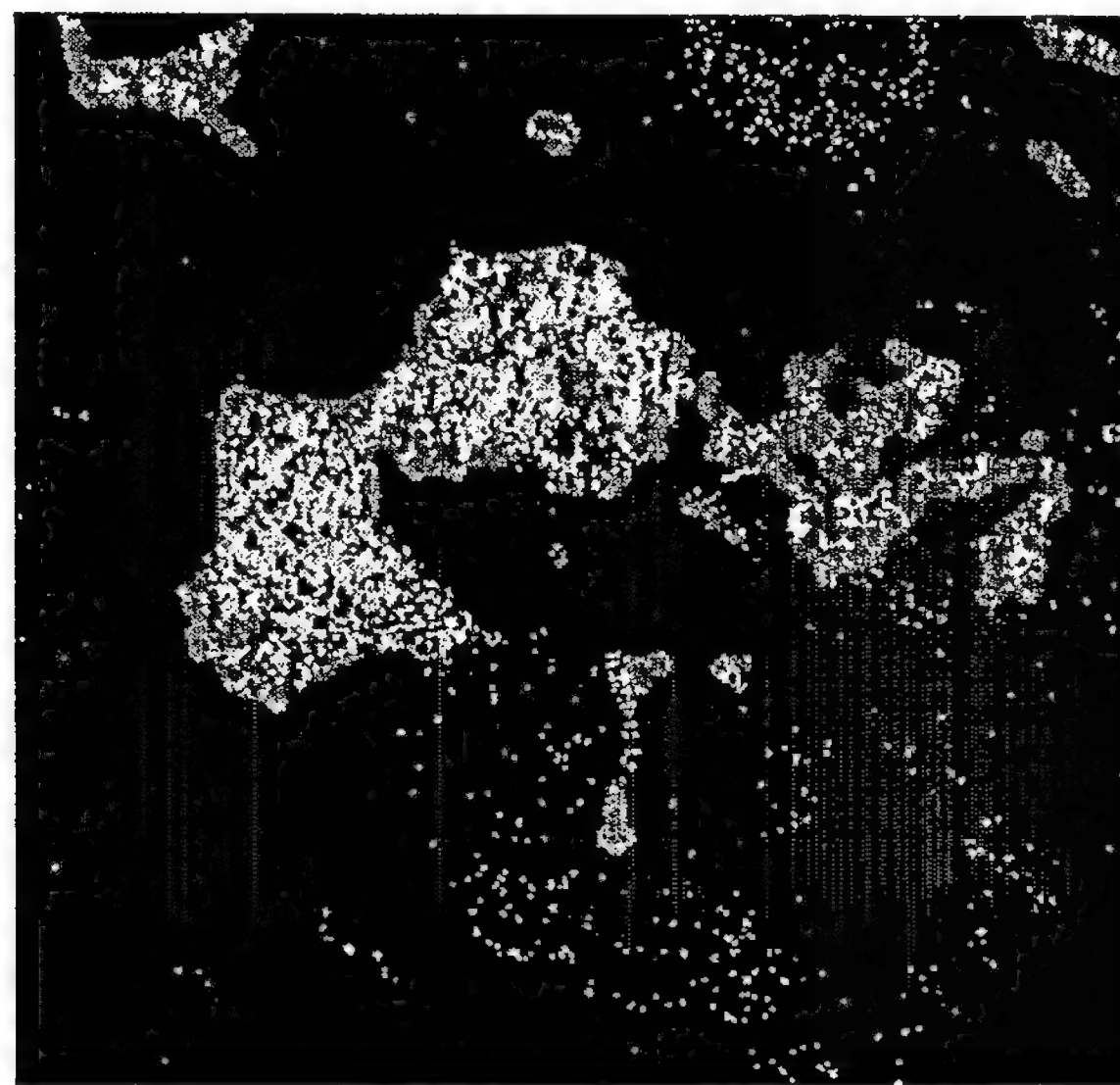
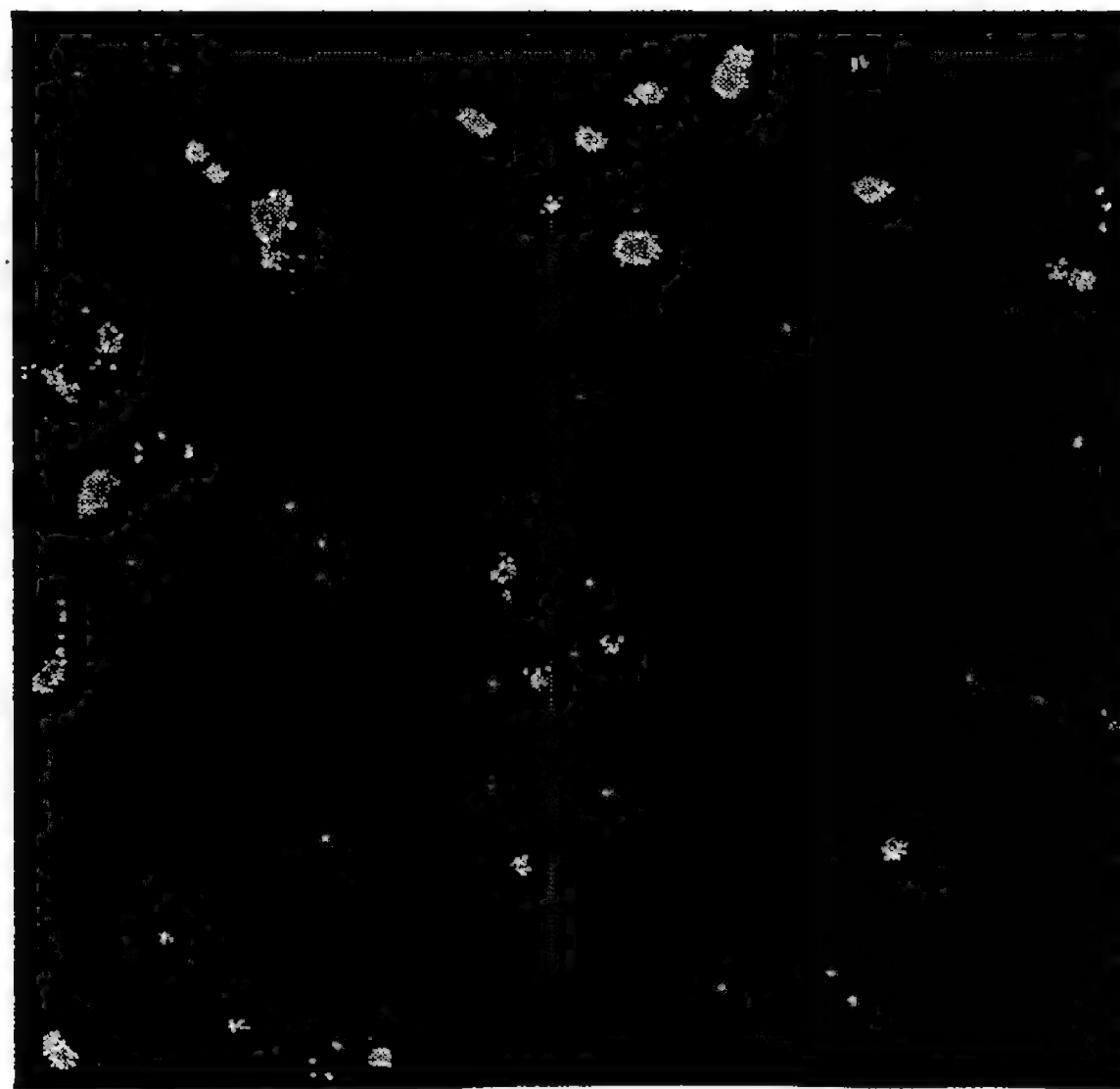
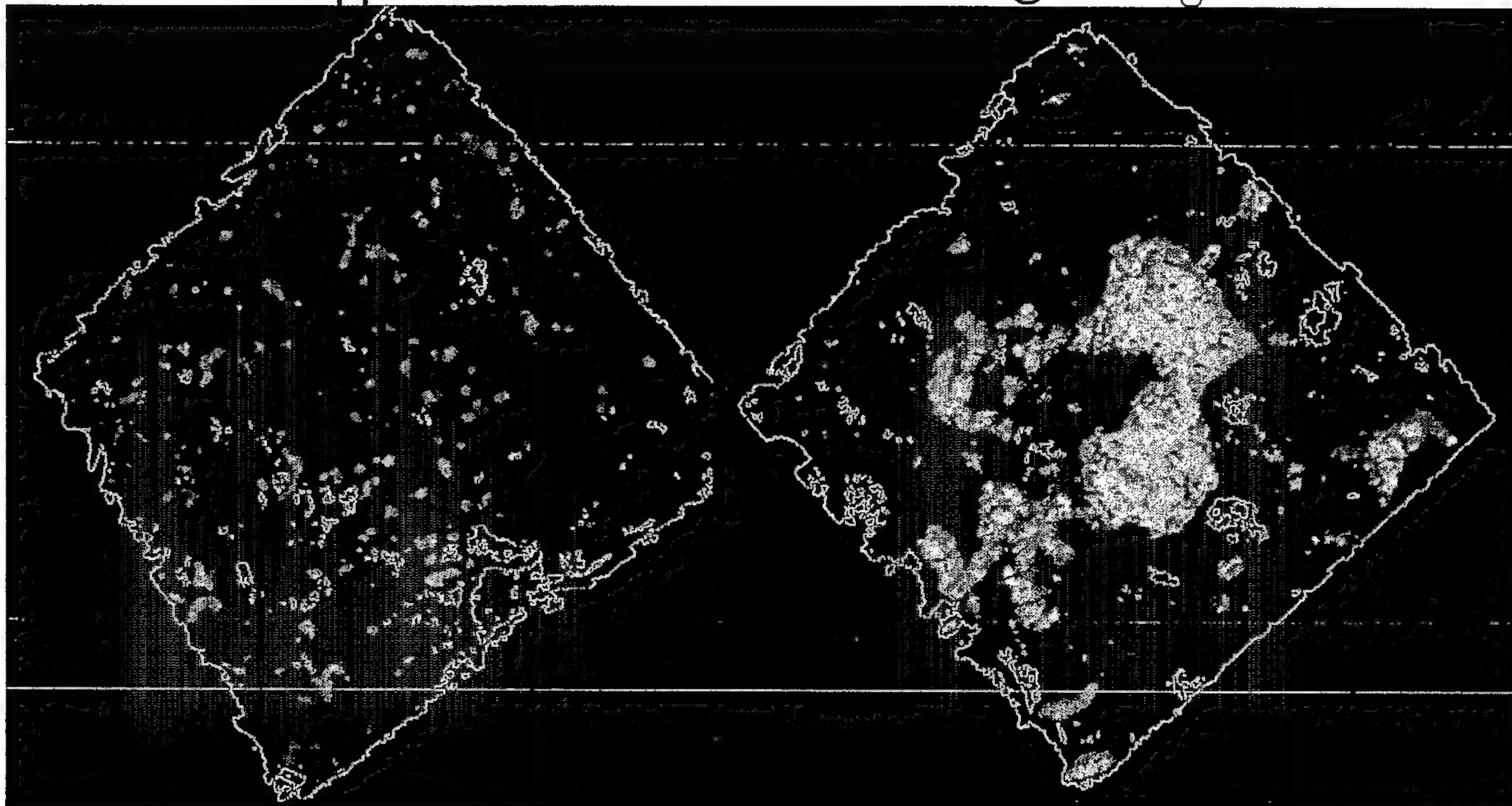
OH1 overexpressing GBS80

infection of ME180 cells

F-actin Blue

$\alpha$ -serotype III capsule Red

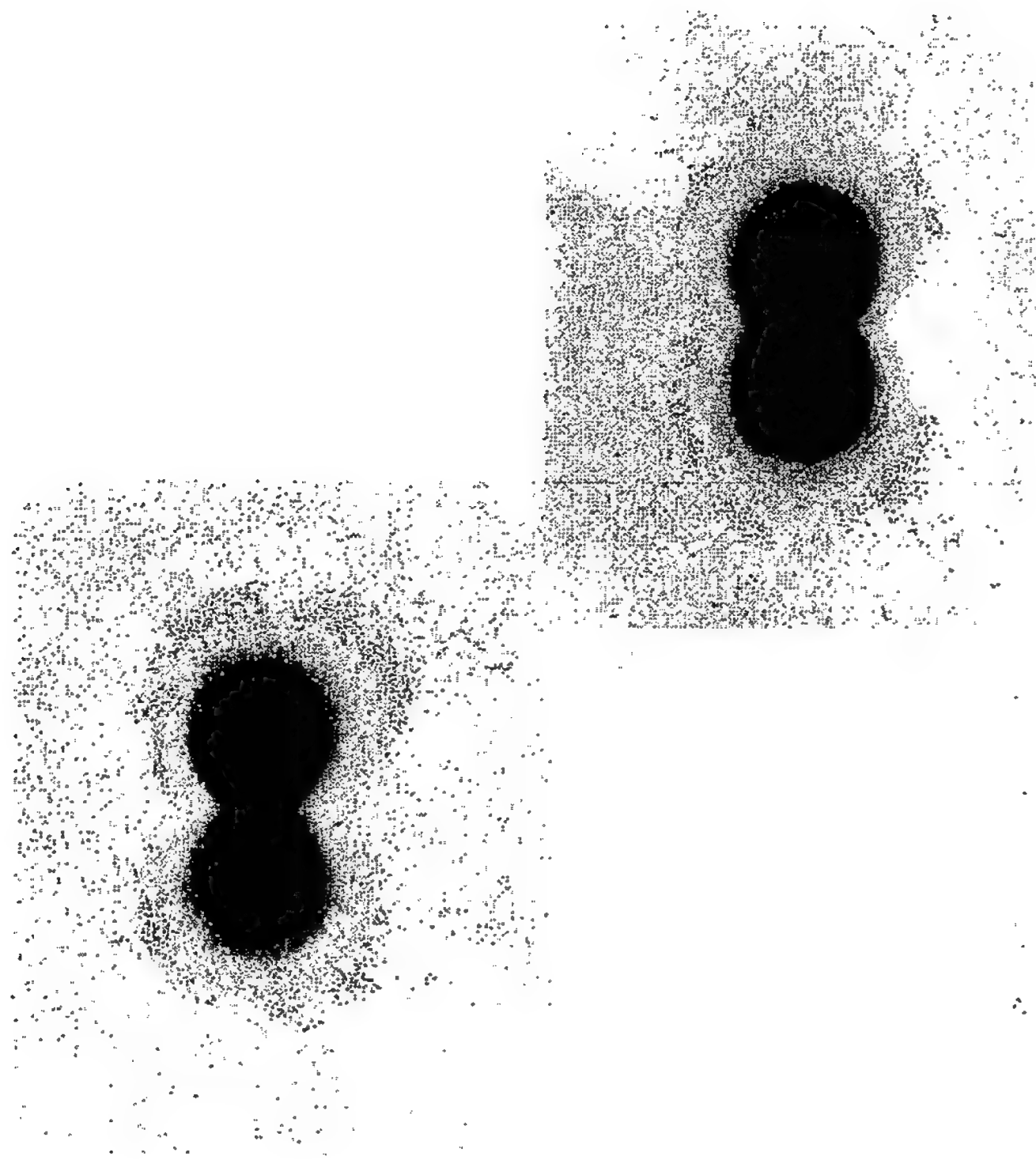
$\alpha$ -GBS80 Green



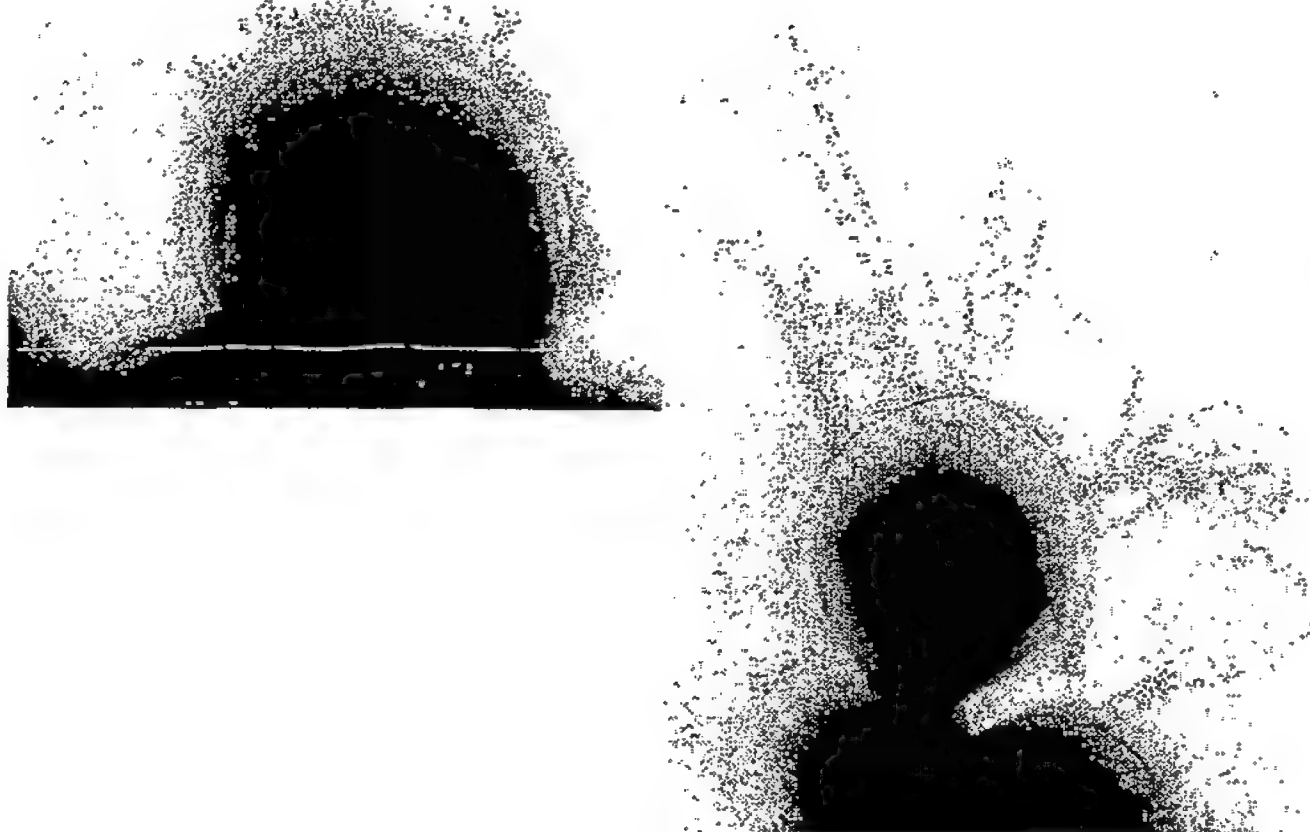
453/487

Figure 215

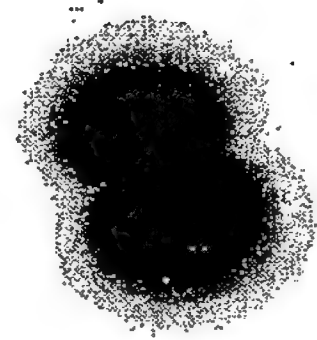
515 WT



515 Δ59p59



515 Δ59



α59

α59



Figure 216

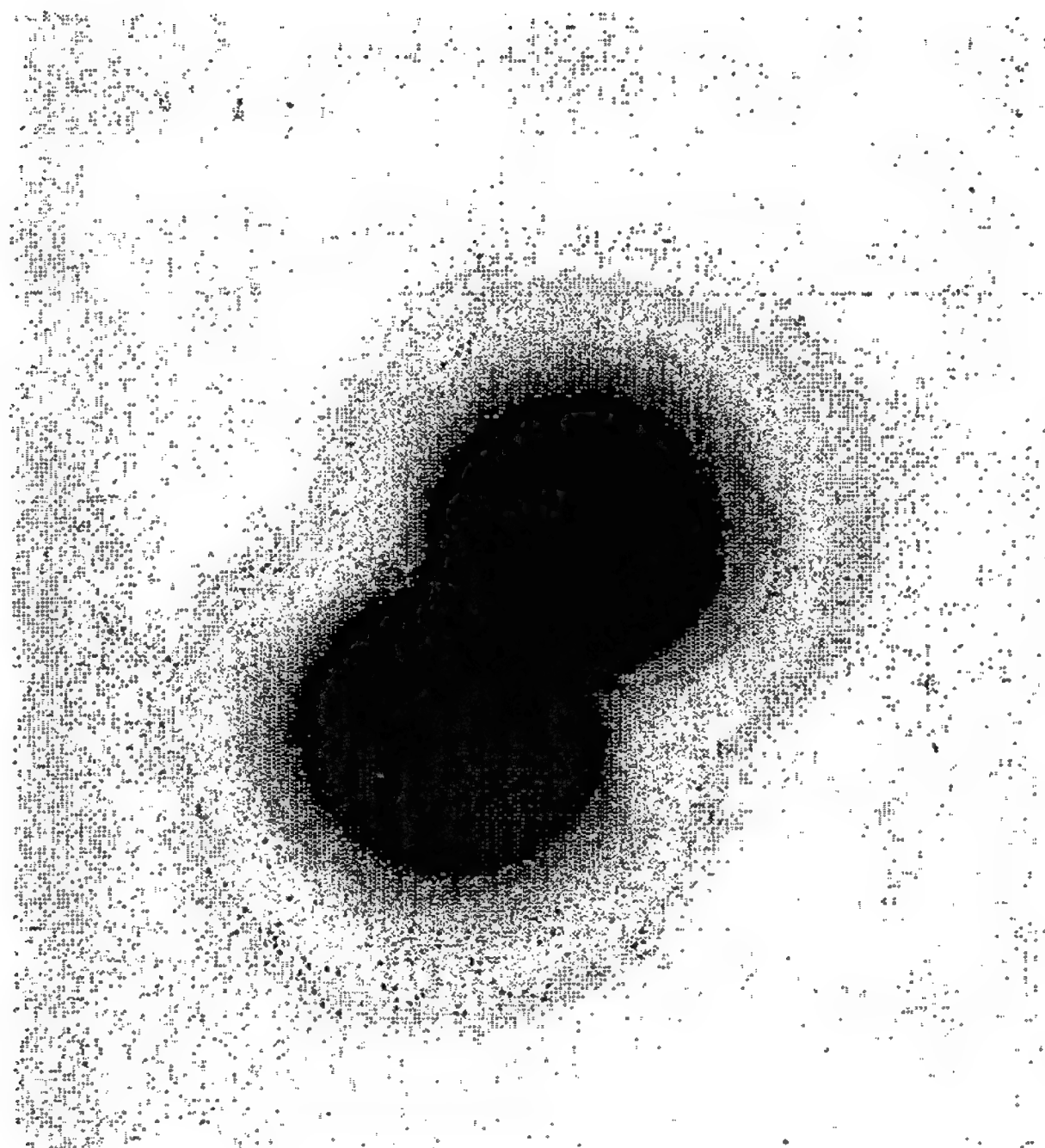
WO 2006/078318

PCT/US05/27239

454/487

PCT/US2005/027239

515 WT



$\alpha 67$

515  $\Delta 67$ p67



$\alpha 67$

515  $\Delta 67$

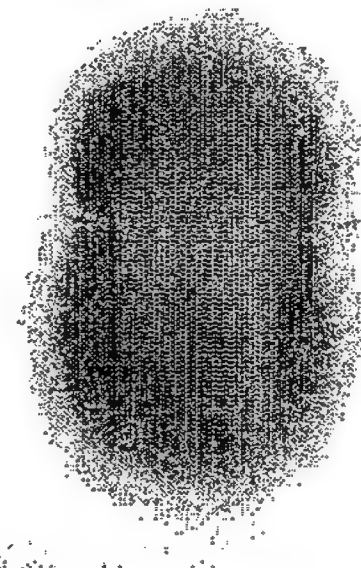


Figure 217

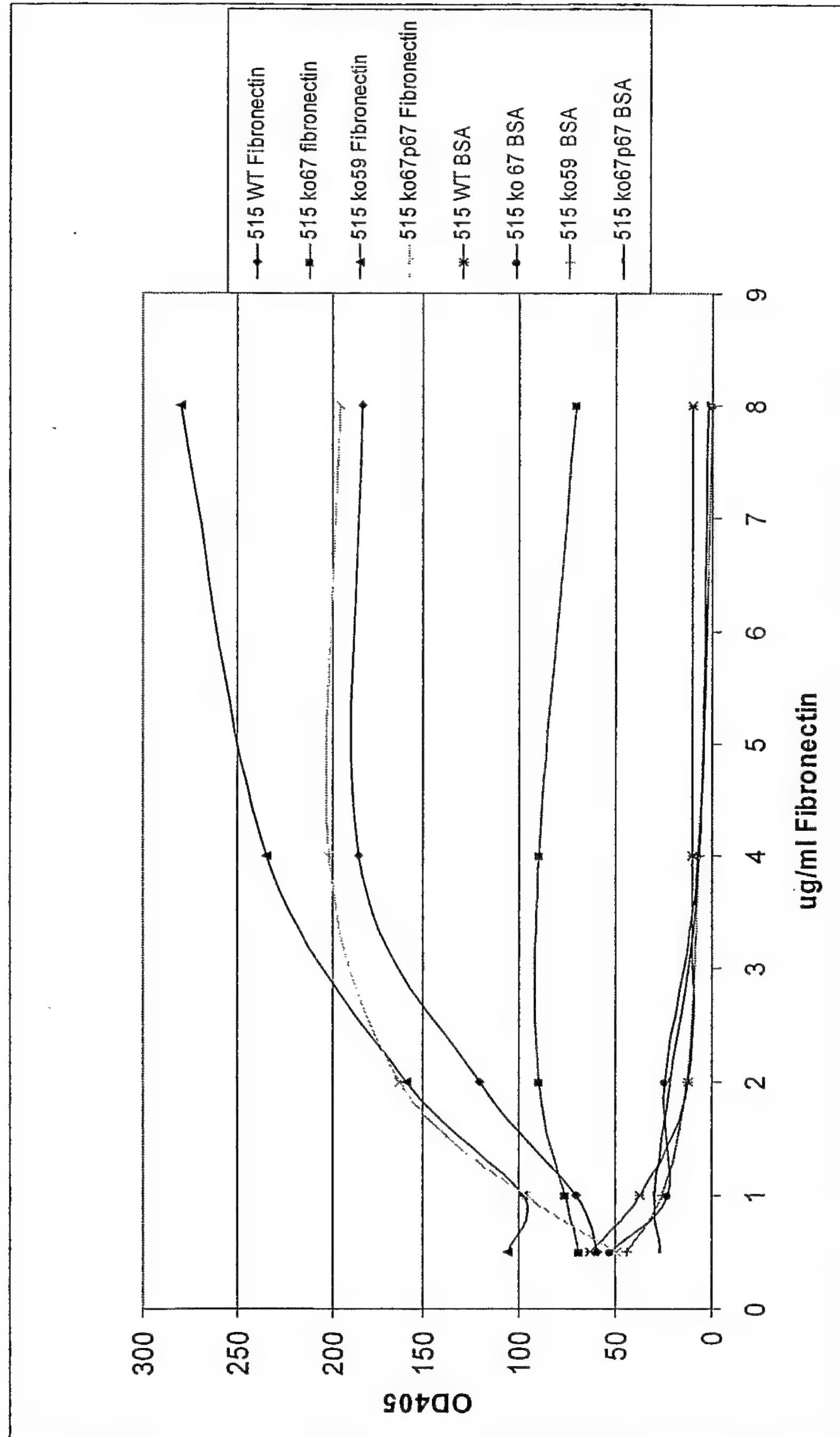
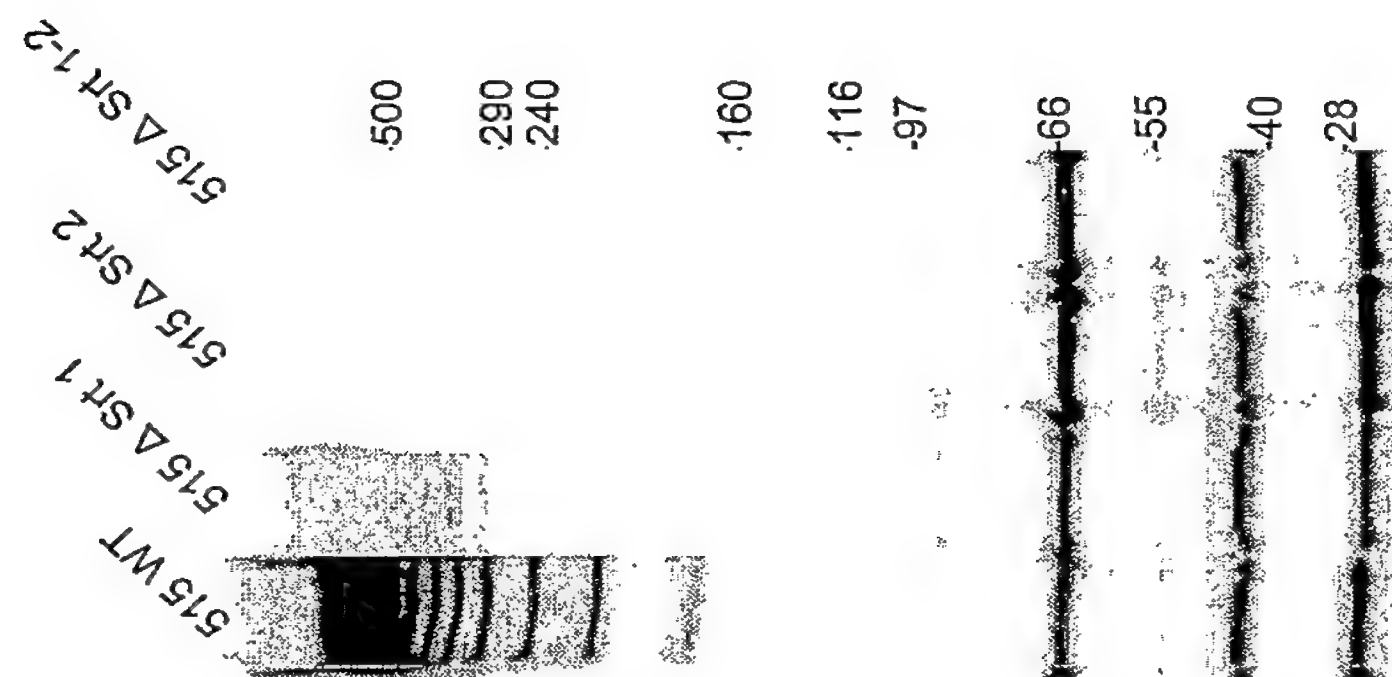
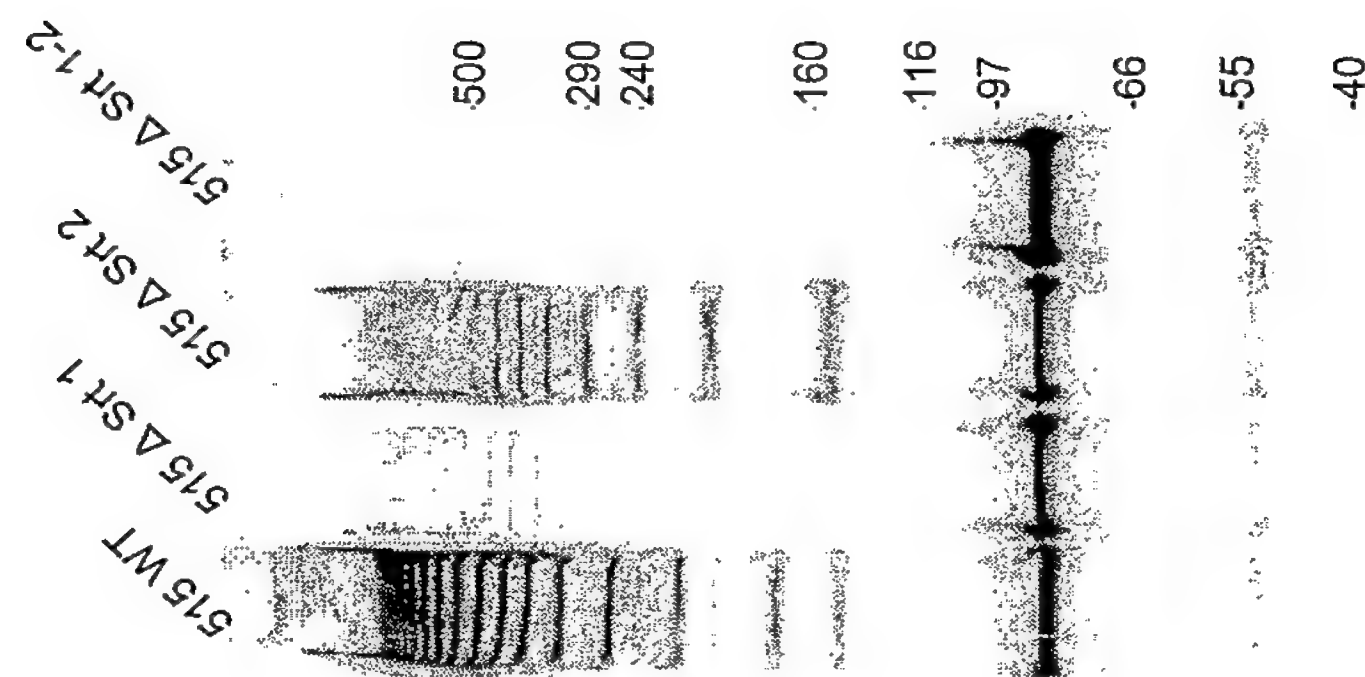
**GBS 67 binds to fibronectin**

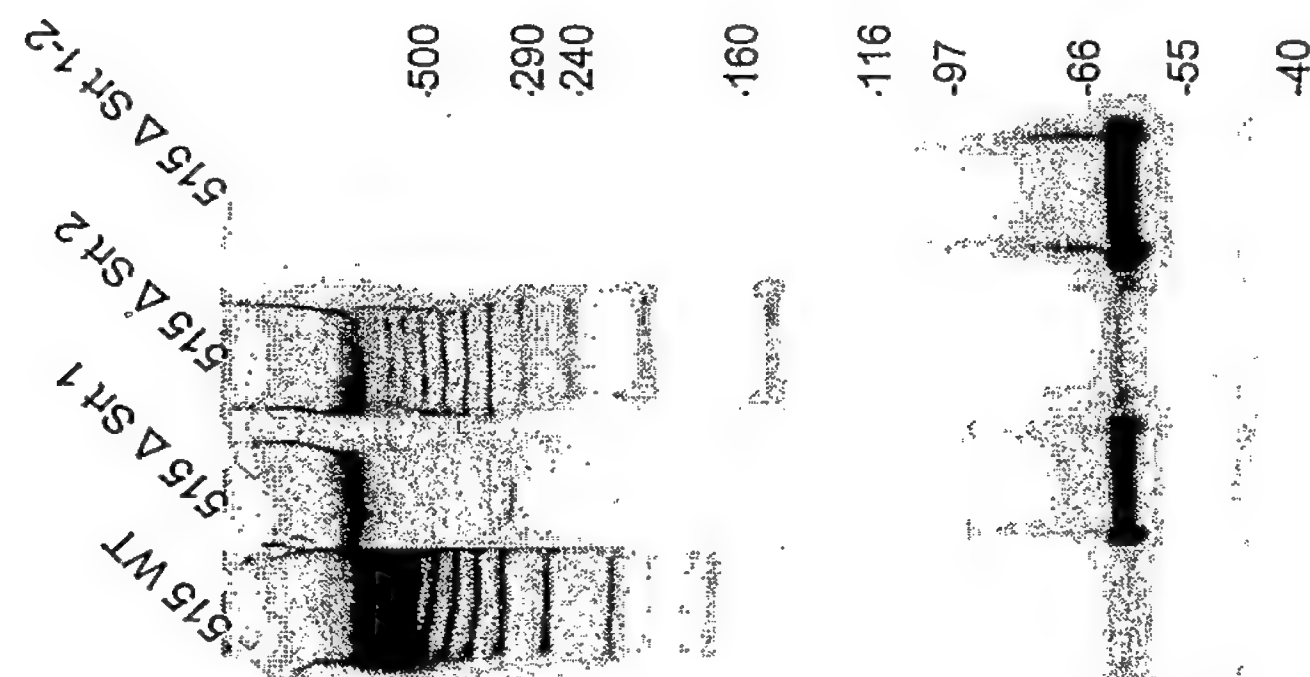
Figure 218



α-GBS 150



α-GBS 67

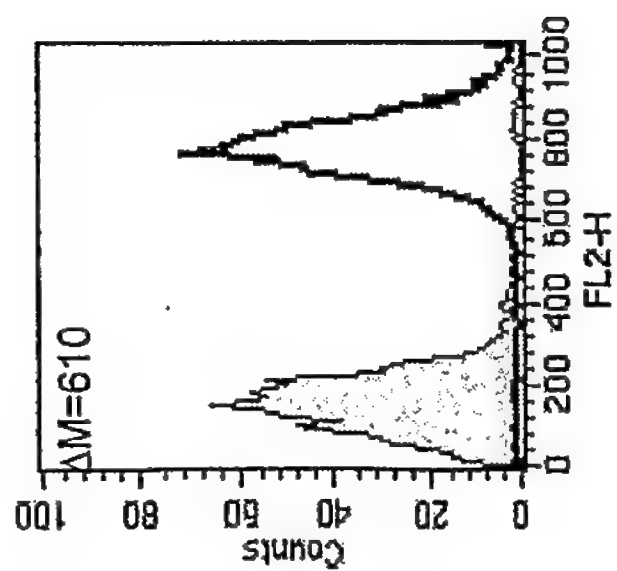


α-GBS 59

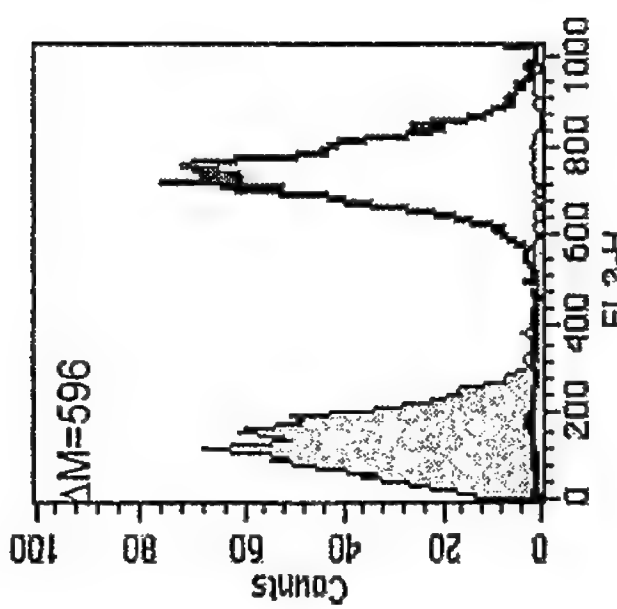


Figure 219

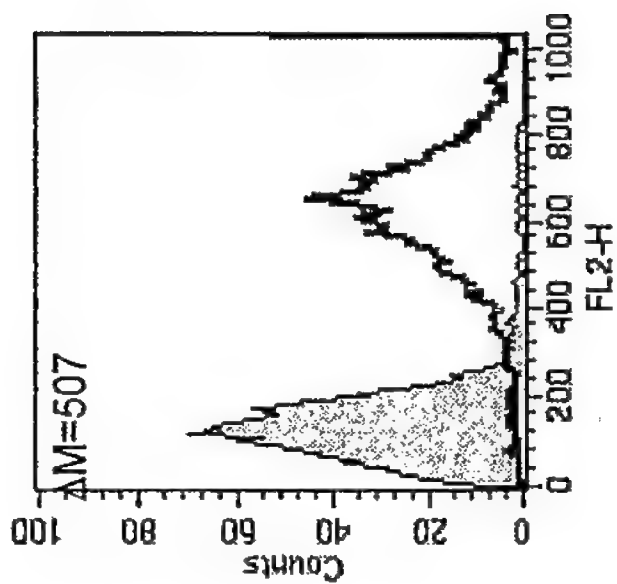
515 WT



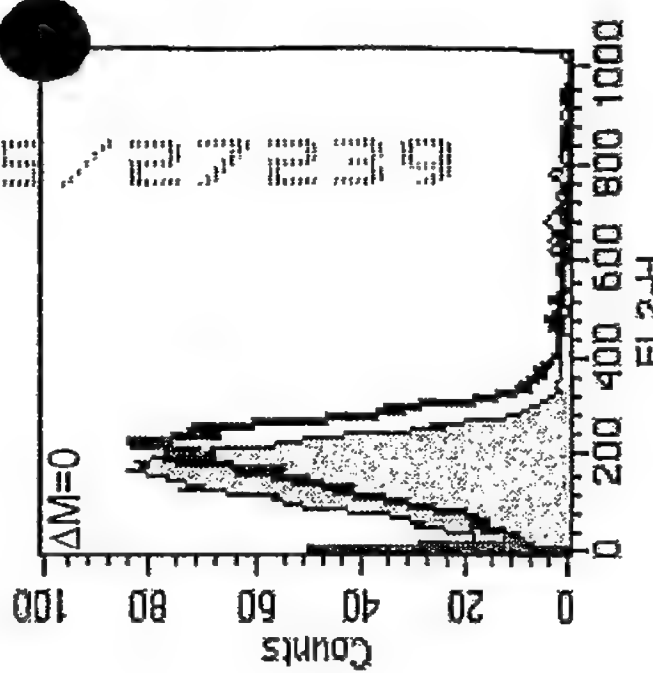
515 Δ Srt 1



515 Δ Srt 2

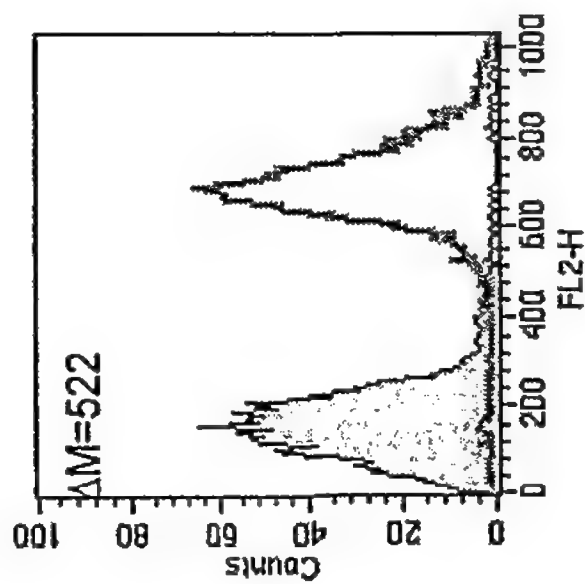


515 Δ Srt 1 2



α59

457/487



α67

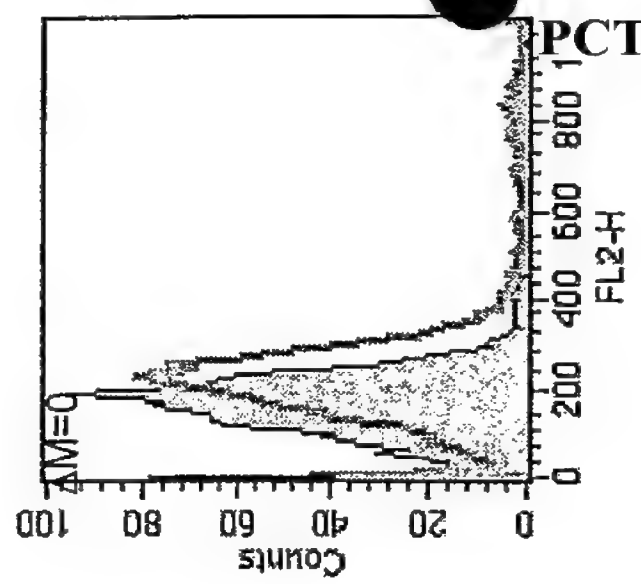
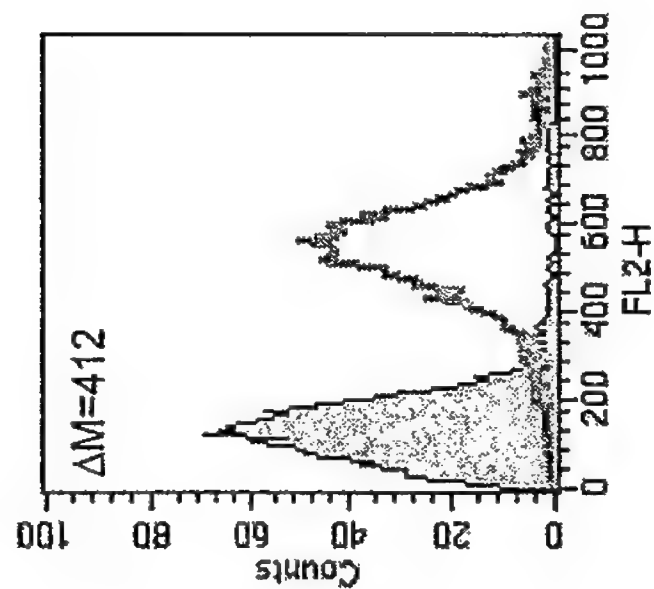
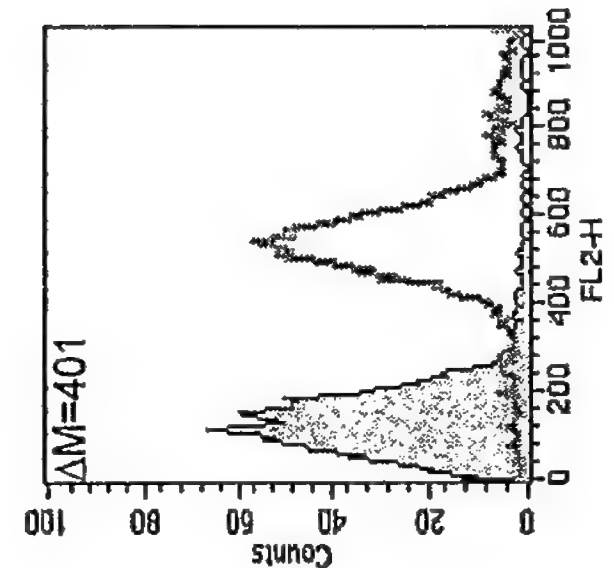
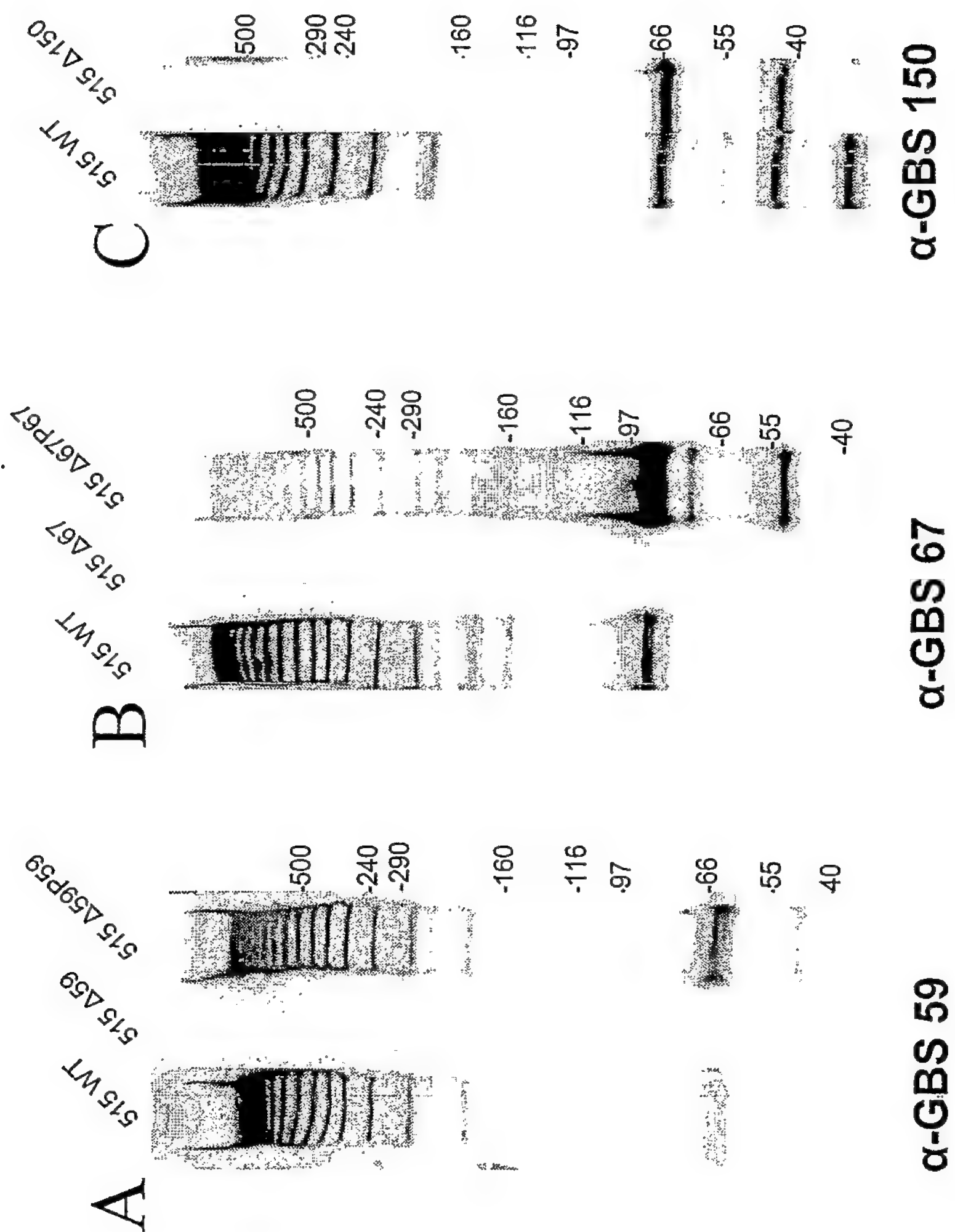


Figure 220



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Figure 221

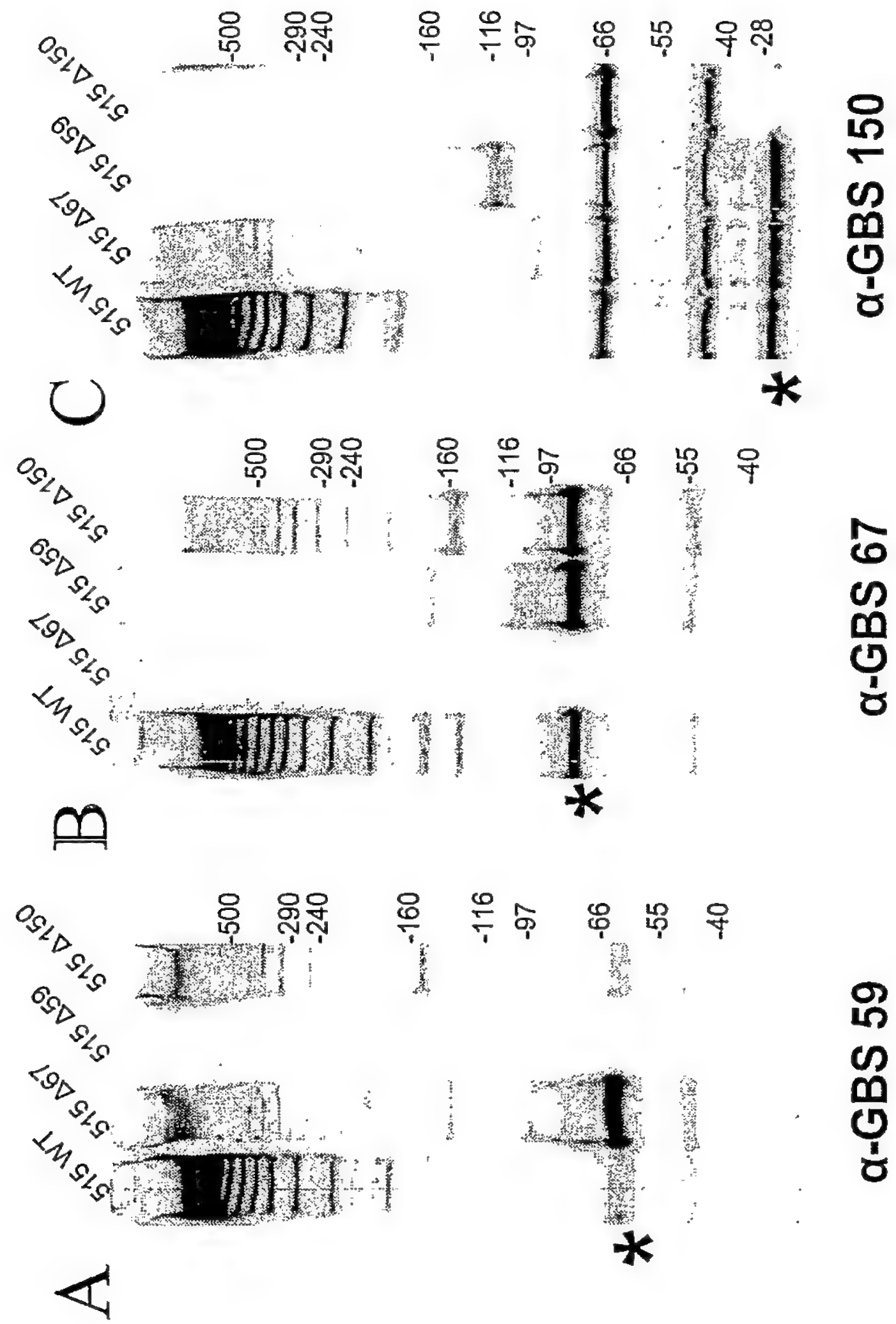
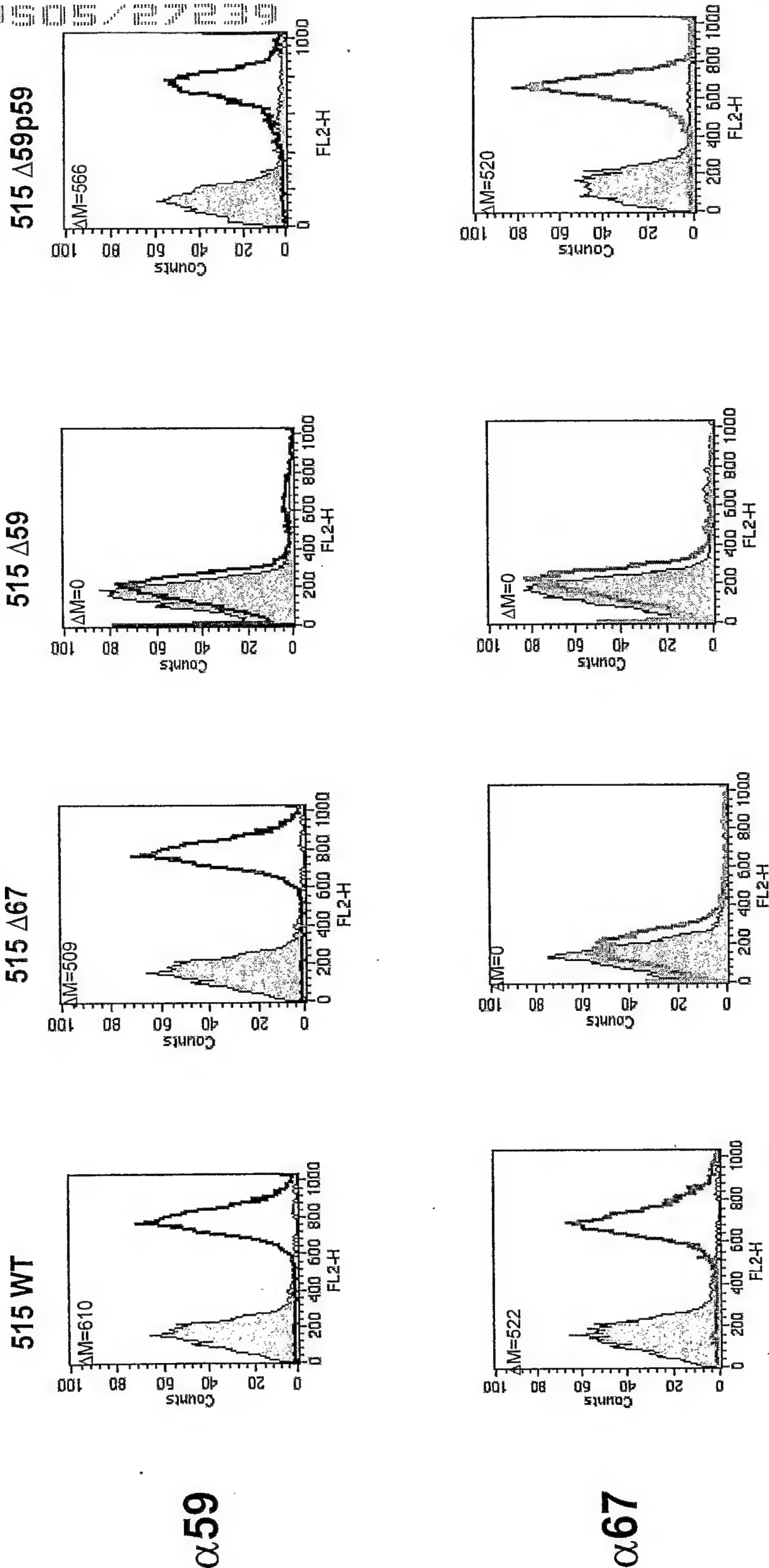


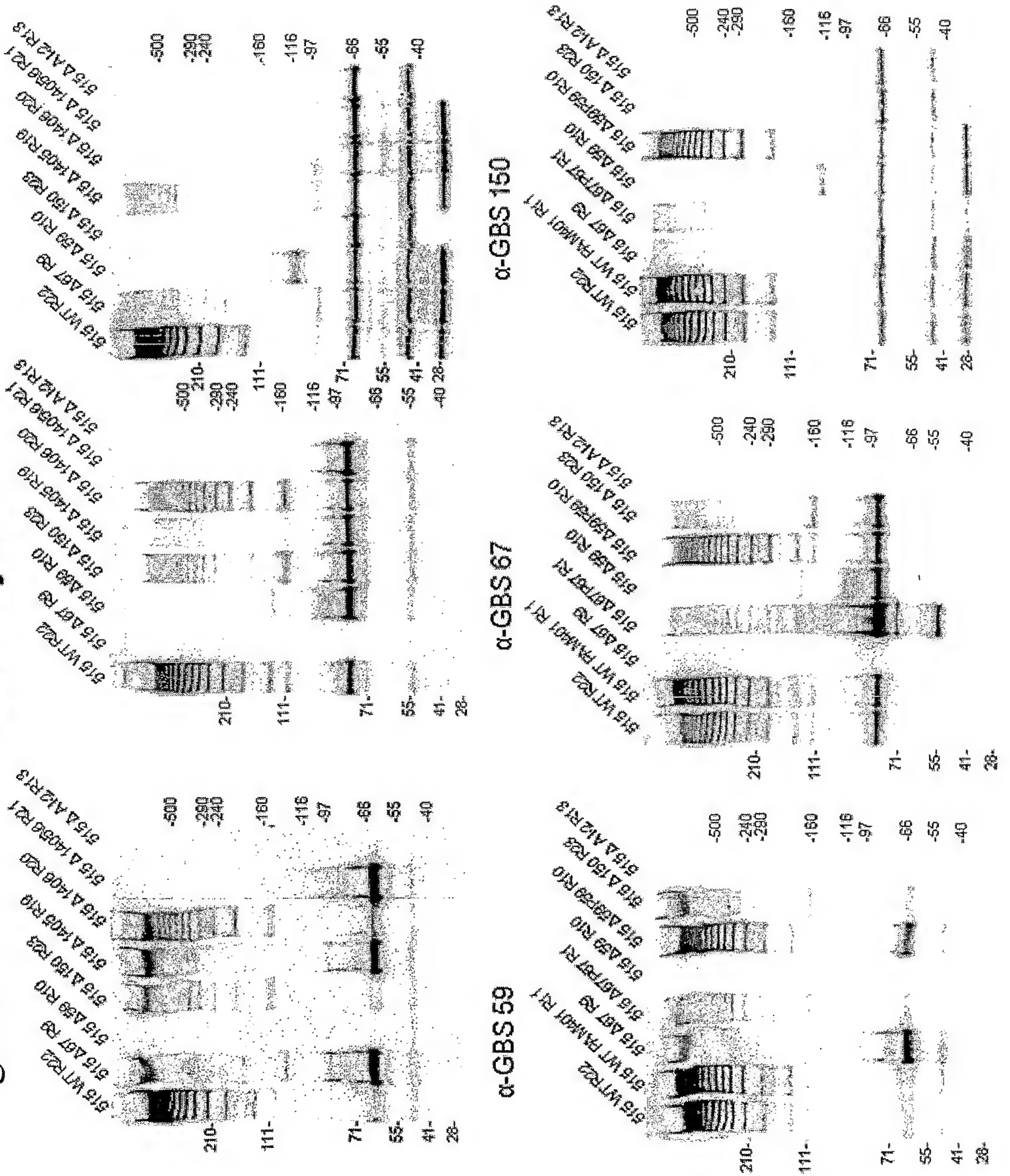


Figure 222



# Summary WB

Figure 223



GBS strain      % AA identity

7357b (Ib)	100
5518 (Ib)	100
5364 (V)	100
1999 (IV)	100
5408 (VIII)	98
coh31 (III)	98
d136c (III)	98
nem316 (III)	98

dk1 (Ia)	100
dk8 (Ia)	100
davis (Ia)	100
5551 (Ia)	100
2986 (Ia)	100
2110 (V)	100
2210 (IV)	100

18RS21 (II)	100
3050 (II)	100
2141 (II)	100
1998 (III)	100
2928 (VII)	99,9

2274 (IV)	99,9
2129 (Ib)	99,7
5401 (II)	99,8

# GBS 59 allelic variants

cjb111 (V)  
674 aa

515 (Ia)  
675 aa

2603 (V)  
705 aa

H36b (Ib)  
693 aa

75%

48%

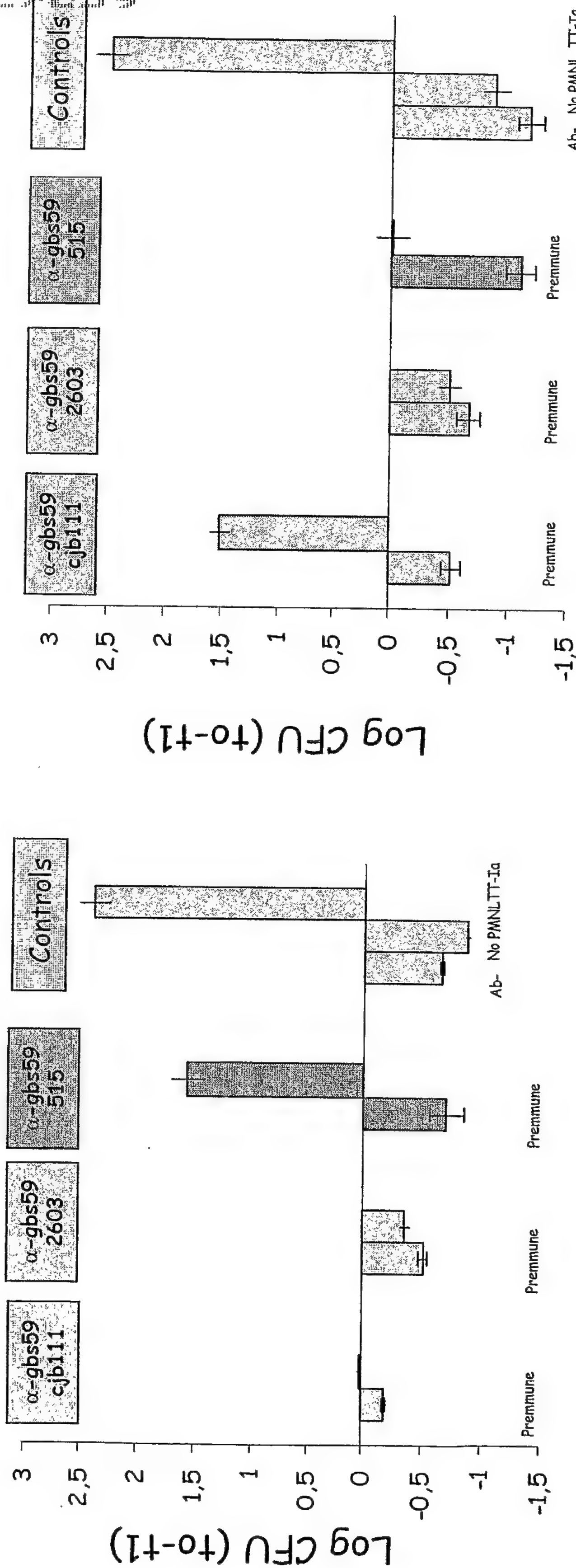
65%

Figure 224



Figure 225

GBS 59 is opsonic only against homologous strain



• 515 (Ia) GBS strain

• cjb111 (V) GBS strain

Figure 226 A

		GBS 59		
GBS strains	Type	PCR	FACS (a-cjb111)	FACS (a-2603)
DK1	Ia	+	565	
DK8		+	559	
Davis		+	577	
515		+	583	0
090		+	0	0
2986		+	443	
5551		+	524	
H36B	Ib	+	0	410
7357b-		+	596	
5518		+	190	
D136C	III	+	504	
COH31		+	505	
1998		+	59	510
18RS21	II	+	0	353
DK21		+	249	0
3050		+	0	570
5401		+	0	400
2141		+	0	371
CJB111	V	+	625	0
2603		+	0	73
5364		+	593	
2110		+	590	0
2274	IV	+	0	400
1999		+	594	
2210		+	636	
5408	VIII	+	537	
CJB110	NT	+	0	0
1169		+	227	0

		GBS 59		
GBS strains	Type	PCR	FACS (a-cjb111)	FACS (a-2603)
A909	Ia	-	22	0
2177	Ib	-	75	
COH1		-	0	
M732		-	0	
M781	III	-	17	
5376		-	60	
5435		-	55	
SMU071		-	0	
JM9130013	VIII	-	0	0

Figure 226 B



Figure 227 A

		FACS (D Mean)				
GBS strains	Type	GBS 80	GBS 104	GBS 67	GBS 322	GBS 59
DK1	Ia	0	0	478	153	565
DK8		0	0	475	213	559
Davis		0	0	430	86	577
515		0	0	409	227	583
090		0	0	0	0	0
A909		46	29	0	0	0
2986		0	0	397	0	443
5551		0	0	485	36	524
2177	Ib	477	355	66	323	0
H36B		0	0	444	105	410
7357b-		91	0	316	102	596
5518		31	0	162	0	190
COH1	III	305	226	0	130	0
D136C		40	40	406	460	504
COH31		0	0	273	479	505
M732		141	101	0	292	0
M781		111	136	0	224	0
1998		140	77	350	288	510
5376		165	156	0	76	0
5435		93	100	0	88	0
18RS21	II	0	0	103	471	353
DK21		0	0	331	342	249
3050		71	46	460	188	570
5401		75	28	618	135	400
2141		0	0	370	76	371
CJB111	V	365	236	481	58	625
2603		62	0	105	293	73
5364		454	281	394	463	593

2110		0	0	589	0	590
2274		123	62	484	161	400
1999	IV	0	389	453	55	594
2210		0	0	574	0	636
SMU071		556	393	74	170	0
JM9130013	VIII	587	436	72	133	0
5408		0	0	433	0	537
CJB110		0	0	245	587	0
1169	NT	0	0	443	213	227
D Mean > 200		6/37 (16%)	7/37 (19%)	24/37 (65%)	14/37 (38%)	24/37 (65%)

Figure 227B

Figure 228

		FACS (ΔMean)																Δmean
GBS Strain	Type	GBS 80		GBS 104		GBS 322		GBS 67 <sub>81</sub>		GBS 67 <sub>H36B</sub>		GBS 59 <sub>2603</sub>		GBS 59 <sub>CJB111</sub>		GBS 59 <sub>515</sub>		neg. control
		142-F		Mab		86												
cde-1	II	114	95	0	0	122	122	360	341	422	403	92	73	254	235	306	287	19
cde-2	IB	173	69	92	0	95	75	552	448	590	486	135	31	635	531	197	93	104
cde-3	II	566	508	360	302	85	60	364	306	433	375	111	53	448	390	310	252	58
cde-4	V	524	432	337	245	284	204	577	485	625	533	105	13	674	582	303	211	92
cde-5	II	140	0	0	0	462	300	487	297	563	373	175	0	373	183	440	250	190
cde-6	V	544	484	361	301	95	95	586	526	601	541	55	0	686	626	302	242	60
cde-7	III	155	116	44	5	134	118	95	56	138	99	74	35	92	53	91	52	39
cde-8	III	347	304	192	149	74	62	98	55	170	127	72	29	88	45	108	65	43
cde-9	II	89	65	0	0	226	191	390	366	504	480	181	157	317	293	410	386	24
cde-10	IA	46	24	0	0	152	152	494	472	531	509	43	21	16	0	48	26	22
cde-11	IA	17	0	0	0	295	135	569	550	569	550	47	28	467	448	648	629	19
cde-12	V	439	430	290	281	60	30	174	165	227	218	52	43	139	130	207	198	9
cde-13	IA	33	0	0	0	216	146	469	436	469	436	100	67	361	328	571	538	33
cde-14	III	78	68	10	0	213	191	50	40	85	75	38	28	69	59	67	57	10
cde-15	III	119	53	24	0	108	98	48	0	127	61	89	23	105	39	100	34	66
cde-16	V	363	335	177	149	310	270	70	42	127	99	48	20	130	102	128	100	28
cde-17	III	160	0	163	0	408	248	377	217	410	250	441	281	359	199	167	7	160
cde-18	III	49	28	0	0	239	218	34	13	36	15	16	0	49	28	56	35	21
cde-19	III	182	101	0	0	361	280	310	229	312	231	384	303	220	139	0	0	81
cde-20	V	348	304	203	159	380	336	166	122	211	167	114	70	232	188	128	84	44
cde-21	II	222	132	83	0	150	60	331	241	336	246	0	0	420	330	59	0	90
cde-22	IA	0	0	13	13	43	43	238	238	238	238	43	43	38	38	429	429	0
cde-22 (9-6-05)		23	0	34	0	110	20	310	220	320	230	113	23	117	27	344	254	90
cde-23	V	484	484	374	374	278	278	124	124	206	206	11	11	91	91	236	236	0
cde-24	V	137	52	0	0	333	248	90	5	110	25	110	25	120	35	70	0	85
cde-25	IA	0	0	0	0	351	190	530	370	565	405	495	335	442	282	625	465	160
cde-26	II	117	2	0	0	185	70	210	95	285	170	30	0	175	60	210	95	115
cde-27	III	323	95	34	0	498	270	346	118	406	178	424	196	314	86	64	0	228
cde-28	V	150	92	20	0	132	74	462	404	505	447	0	0	526	468	78	20	58
cde-29	IV	90	73	65	48	195	178	90	73	150	133	150	133	138	121	110	93	17
cde-30	V	390	187	336	133	348	145	229	26	244	41	113	0	268	65	223	20	203
cde-31	IA	22	0	68	0	306	182	368	244	386	262	126	2	248	124	426	302	124
cde-32	IA	45	0	12	0	260	175	190	105	205	120	30	0	100	15	185	100	85
cde-33	II	50	0	0	0	306	156	134	0	237	87	4	0	180	30	190	40	150
cde-34	III	152	60	47	0	342	250	44	0	74	0	27	0	102	8	48	0	92
cde-35	V	227	227	40	40	246	246	395	395	415	415	0	0	550	550	142	142	0
cde-36	IB	25	15	8	0	30	20	154	144	174	164	33	23	222	212	20	10	10
cde-37	III	168	53	61	0	361	246	82	0	133	18	83	0	132	17	75	0	115
cde-38	II	140	14	30	0	338	212	124	0	198	72	158	32	138	12	104	0	126
cde-39	II	126	0	0	0	316	148	466	298	514	346	438	270	184	16	34	0	168
cde-40	V	420	366	214	160	22	0	103	49	162	108	90	36	209	155	192	138	54
cde-41	II	146	31	15	0	380	265	330	215	425	310	140	25	280	165	315	200	115



Figure 229

# Expected strain coverage

MIX GBS proteins

vaccine options		w/o 59	w/o 322	w/o 104+322	w/o 59+322	223	
	80+104+67+59+322	80+104+67+322	80+104+67+59	80+67+59	80+104+67	80+59	
n. antigens FACS+++							
1	89%	89%	80%	80%	79%	74%	
2	74%	51%	71%	64%	24%	16%	
3	23%	14%	17%	16%	13%		

- GBS 322 but not GBS 59 is important to increase strain coverage
- GBS 59 probably could be useful to increase the vaccine strength

## Assumption:

- Protein antigens that are highly accessible to antibodies confer 100% protection with suitable adjuvants

Figure 230

GBS 59 opsonophagocytic activity is comparable to that of the four-protein mix

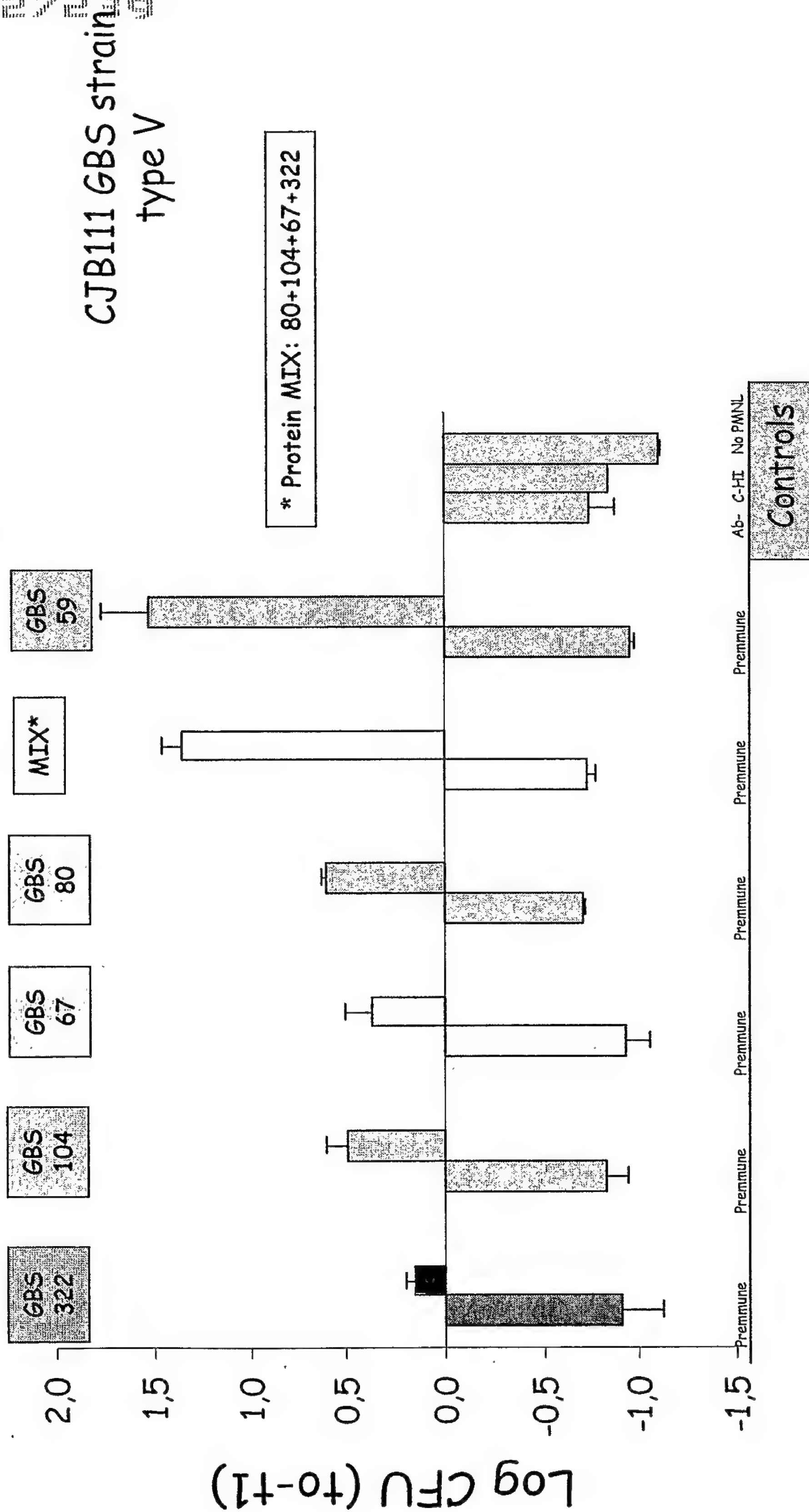


Figure 231

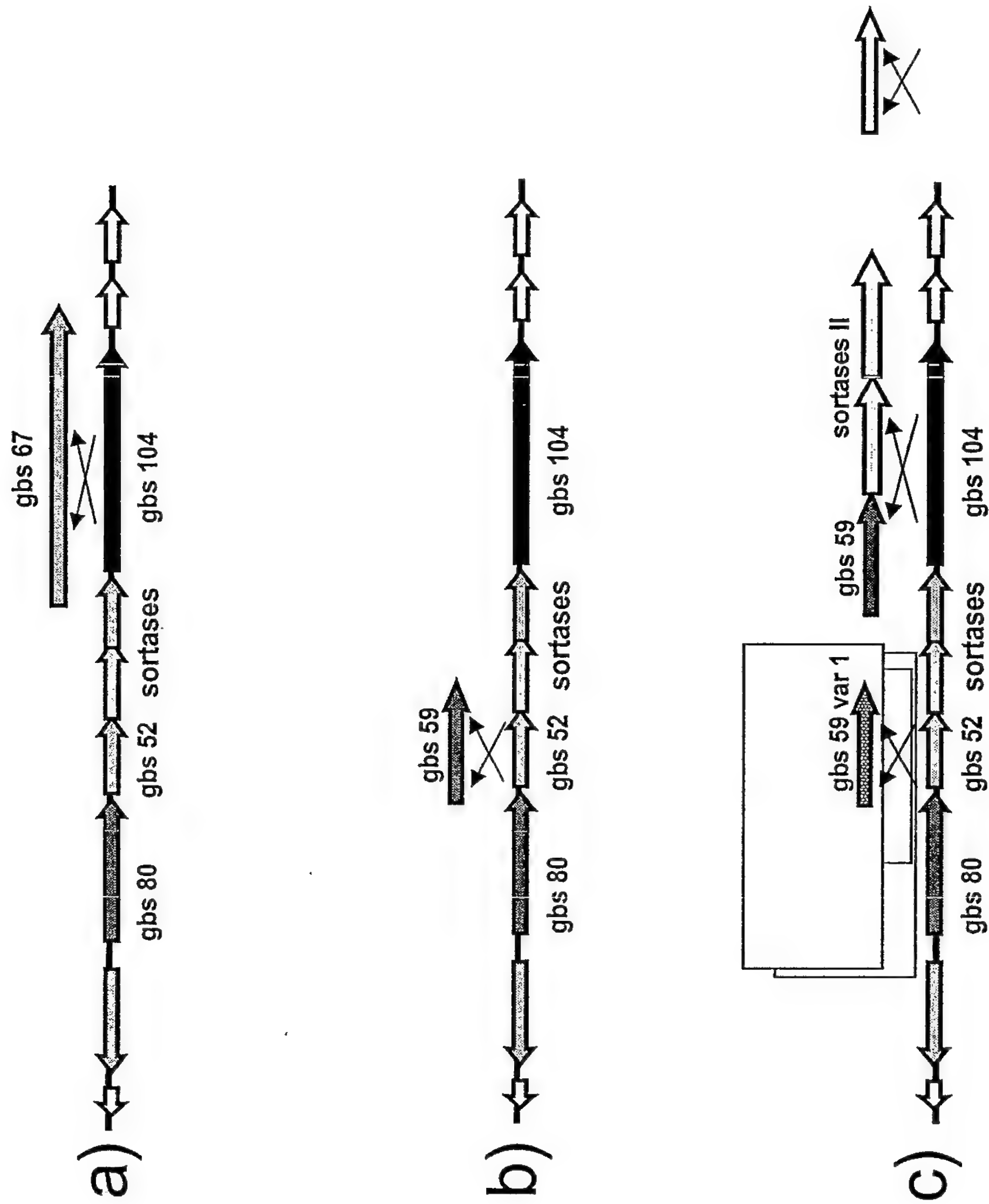
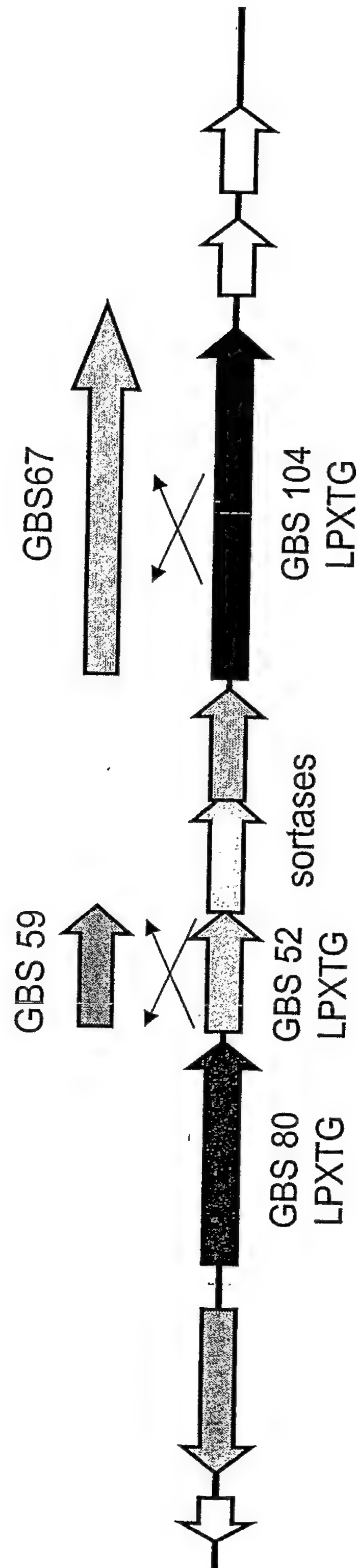




Figure 232



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Figure 233

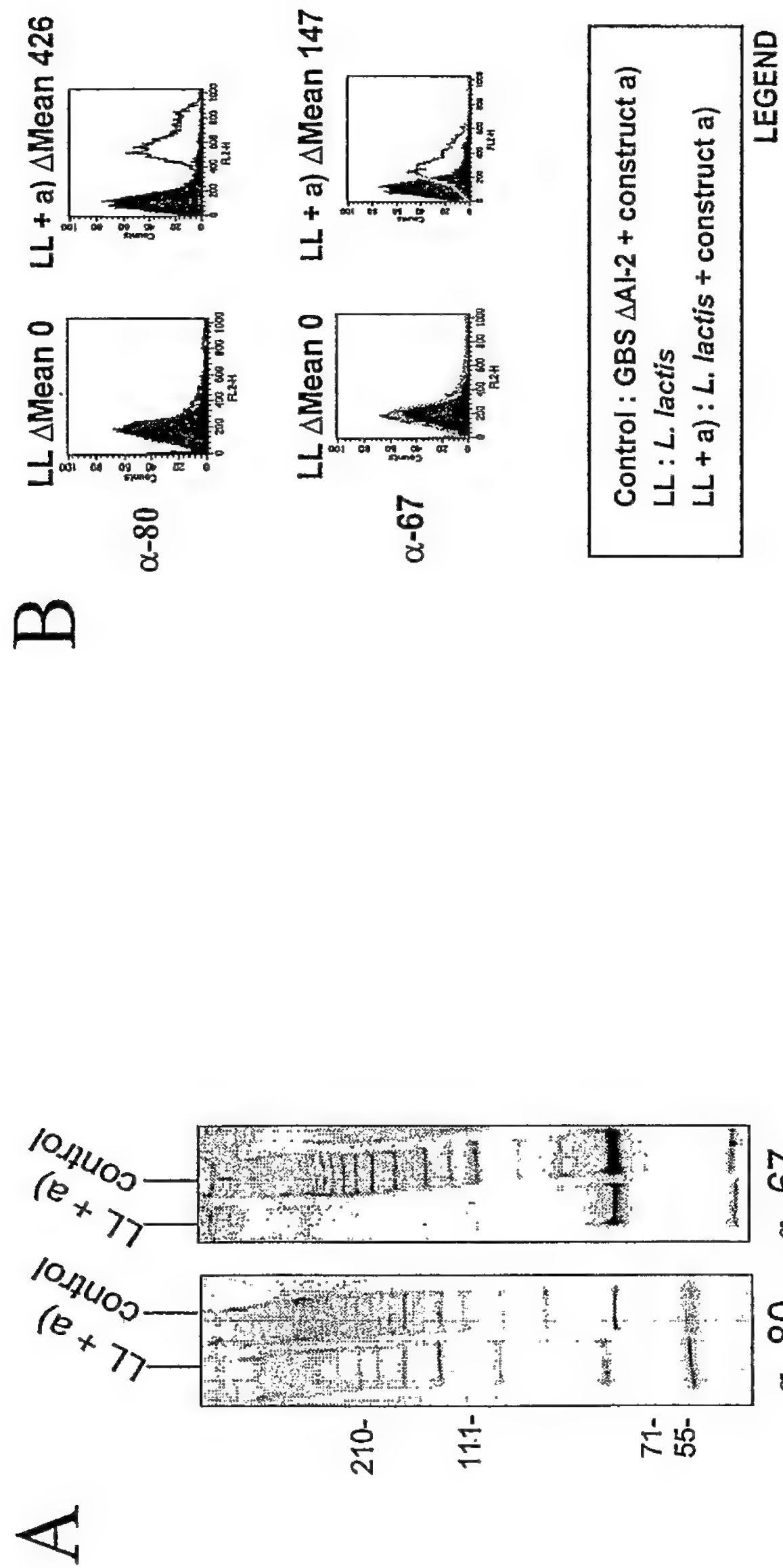
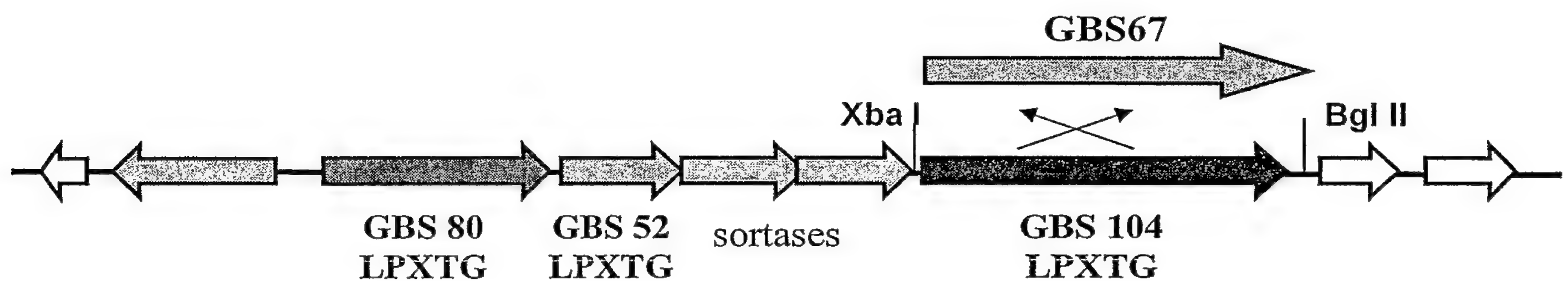


Figure 234 A

## Introducing Heterologous Antigens into AI-1 pilus to Obtain Protection Across GBS Strains

### 1- Substitution of GBS 104 with GBS67 from Island II

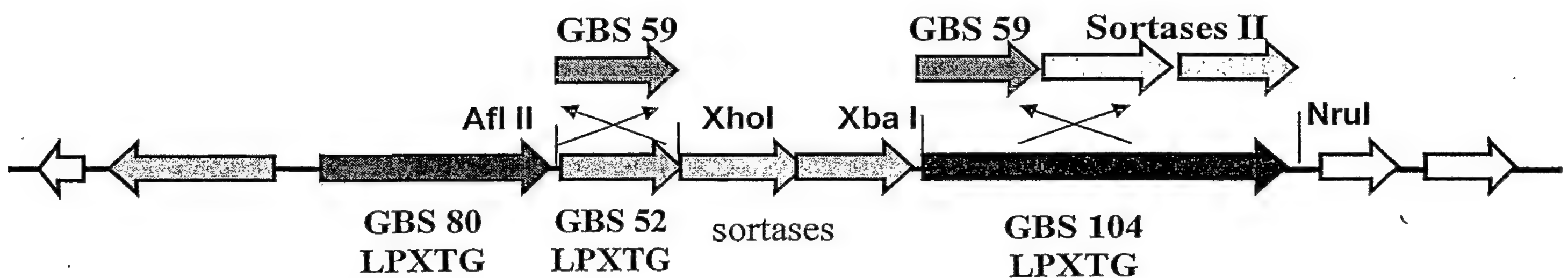


Oligo GBS67pAMXbafor AGTCAGTCTCTAGACGGCACAATAGGAGTTGTAAA

Oligo GBS67pAMBglrev CACCTGTCATAGATCTTAAGAATACTAAAGCGCATAA

### 2- Substitution of GBS52 or 104 with:

- GBS 59 alleles 515 or CJB
- GBS 59 allele CJB111 + sortases island II
- GBS 59 allele 515 + GBS 59 CJB111 + sortases island II



### DETAILS:

a) Oligos to be used:

Oligo 59pAMAfIfor1 AGTCAGTCCTTAAGCCGCATATTATTAATCATGTTG (allele 515)

Oligo 59pAMAfIfor1 AGTCAGTCCTCGAGTTAACTTCCTCTGATTGACG (allele 515)

Oligo 59pAMAfIfor2 AGTCAGTCCTTAAGAAGGAGTGGTGCTGCGGTAA (allele CJB111)

Oligo 59pAMXhorev2 AGTCAGTCCTCGAGTTAAGCTTCCTCTGATTGACG (allele CJB111)



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b) Oligos to be used:

**Oligo GBS59XbaF** CTAGTGATATATCTAGAGAAAAAG

**Oligo Sort59NruR** CTAGCTAGTCGCGACTTTTTCATTTTGGATTCCCTTTC

## Figure 234 B

### 3- Substitution of GBS104 with a fusion of GBS322-GBS67 to include GBS 322 into AI-1

- a) Construct 1: GBS67 complete sequence included
- b) Construct 2: Only part of GBS 67 was included (*deleted bold region*)

#### DETAILS:

##### a) Construct 1:

##### Legend:

Pink GBS322

Black GBS67

*Black Bold:* fragment of GBS67 eliminated in construct 2

Green PK motifs

Yellow E motifs

Red LPXTC

> gbs67-515 + 322

```
MRKYQKFSKILTLSLFCLSQIPLNTNVLGESTVPENGAKGKLVVKKTDDQNKPLSKATFV
LKTTAHPESKIEKVTAELTGEATFDNLIPGDYTLSEETAPEGYKKTNQTWQVKVESNGKT
TIQNSGDKNSTIGQNQEELDKQYPPTGIYEDTKESYKLEHVKGSPVNGKSEAKAVNPYSS
EGEHIREIPEGTLKRISSEVGD LAHNKYKIELTVSGKTIVKPVDKQKPLETDTTWTARTVSEV
KADLVKQDNKSSYTVKYGDTLSVISEAMSIDMNV LAKINNIADINLIYPETTLTVTYDQKSHIA
TSMKIETPATNAAGOTTATVDLKTNOQSVADQKVS LNTISEGMTPEAATTIVSPMKTYSSAP
ALKSKEVLAQEQAVSQAAANEQVSPAPVKSITSEVPAAKEEVKPTOTSVSQSTTVSPASVA
AETPAPVAKVAPVRTVAAPRVASVKVYTPK VETGASPEHVSAPAVPVTTTSPATDSKLOAT
EVKSPVVAQKAPTATPVAQPASTTNAAVAHPENAGLQPHVAAYKEKVASTYGVNEEFSTYRAC
DRGDHGGKGLAVDFIVGTNOALGNKVAQYSTONMAANNISYVIWQOKFYSN
INSIYGPA NTWNAMPDRGGVTANHYDHYVHVSFNKDVVFVLDNSNS
MNNDGPNFQRHNKAKKAAEALGTAVK DILGANS DNRVALVTYGS DIFDGRSVDVVKGFKE
DDKYYGLQTKFTIQTENYSHKQLTNNAEEIIRIPTEAPKAKWGSTTNGLTPEQQKEYYL
SKVGETFTMKAFMEADDILSQVNRNSQKIIVHVT DGVPTRSYAINNFKL GASYESQFEQM
KKNGYLNKSNFLLTDKPDDIKMGESYFLFPLDSYQTQIISGNLQKLHYLDLNLNYPKGT
IYRNGPVKEHGTPTKLYINSLKQKNYDIFNFGIDISGFRQVYNEEYKKNQDGT FQKLKEE
```

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AFKLS DGEITELMRSFSSKPEYYTPIVTSADTSNNEILSKIQQQFETILTKENSIVNGTI  
EDPMGDKINLQLGNGQILQPSDYTLQGNDGSVMKDG IATGGPNNDGGILKGVKLEYIGNK  
LYVRGLNLGEGQKVTLTYDVKLDDSFISNKFYDTNGRTTLNPKSEDPNTLRDFPIPKIRD  
VREYPTITIKNEKKLGEIEFIKVDKDNNKLLLKGATFELQEFNEDYKLYLPIKNNNSKVV  
TGENGKISYKDLKDGKYQLIEAVSPEDYQKITNKPILTFEVVKGSIKNIIAVNKKQISEYH  
EEGDKHLITNTHIPPKGIKTKGKGILSFILIGGAMMSIAGGIYWKRYKKSSDMSIKK  
D



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## Figure 234 C

## b) Construct 2:

&gt;gbs67-515 deleted+ 322

MRKYQKFSKILTSLFCLSQIPLNTNVLGESTVPENGAKGKLVVKKTDQNKPLSKATFV  
 LKTTAHPESKIEKVTAELTGEATFDNLIPGDYTLSEETAPEGYKKTNQTWQVKVESNGKT  
 TIQNSGDKNSTIGQSQEELDKQYPPTGIYEDTKESYKLEHVKGSPNGKSEAKAVNPYS  
 SEGEHIREIPEGTLSEVVDLAHNKYKIELTVSGKTIVKPVDKQKPLETDTTW  
 TARTVSEVKADLVKQDNKSSYTVKYGDTLSVISEAMSIDMNVLAKEINNIADINLIYPETTLTV  
 TYDQKSHATATSMKIETPATNAAGQTTATVDLKTNOVSVADQKVSNTISEGMTPEAATT  
 VSPMKTYSSAPALKSKEYLAQEQAVSQAAANEQVSPAPVKSTSEVFAAKEEVKPTQTS  
 VSGSTTVSPASVAAETPAPVAKVAPVTVAPRYASVKVYTPKVETGASPEHVSAPAVE  
 VTTTSPATDSKLQATEVKSVFVAQKAPTATPYAQPASTTNAAVAHPENAGLOPHVAAYK  
 EKVASTYGVNEFSYRAGDPGDHCKGLAVDFVGTNQAIGNKYAOYSTQNMAANNISYV  
 WQOKFYSTNSIYGPANTWNAMPDRGGVTANHVDHVSFENKGESYFLPLDSYQTQ  
 IISGNLQKLHYLDLNLNYPKGTIYRNGPVKEHGTPTKLYINSLKQKNYDIFNFGIDISGFRQ  
 VYNEEYKKNQDGTGFQKLKEEAFKLSDGEITELMRFSKPEYYTPIVTSADTSNNEILSKI  
 QQQFETILTKENSIVNGTIEDPMGDKINLQLGNGQILQPSDYTLQGNDGSVMKDGIATGG  
 PNNDGGILKGVKLEYIGNKLYVRGLNLGEGQKVTLTYDVKLDDSFISNKFYDTNGRTTLN  
 PKSEDPNTLRDFPIPKIRDVREYPTITIKNEKKLGEIEFIKVDKDNNKLLLKGATFELQEFNE  
 DYKLYLPIKNNNSKVVTGENGKISYKDLKDGKYQLIEAVSPEDYQKITNKPILTFEVVKS  
 IKNIIAVNKQISEYHEEGDKHLITNTHIPPKGIKGTGCKGILSFILIGAMMSIAGGIYWKRY  
 KKSSDMSIKKD

Oligos to be used:**Oligo GBS67pAMXbafor (vedi operone)**

AGTCAGTCTCTAGACGGCACAAATAGGAGTTGTAA

XbaI

**Oligo GBS67soe1rev**

GGACCGTGGTATCTCTTTCTAACGGCTTTTGTGTGTCCT

**Oligo GBS322soe2for**

GACAAACAAAAGCCGTTAGAAACAGATACGACGTCGACAG

**Oligo GBS322soe2rev1 (per costrutto non deleto in 67)**

GAGTACGAAGACAACATCTTTCTTAAATGATACGTCGACCG

**Oligo GBS322soe2rev2 (per costrutto deleto in 67)**

TAAAAAGTAACTCTCCCCCTTTCTTAAATGATACGTCGACCG

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**Oligo fine67soe3for1 (per costrutto non deleto in 67)**

CAGGTATCATTTAACAAA GATGTTGTCTTCGTA CT CGAT

**Oligo fine67soe3for2 (per costrutto non deleto in 67)**

CAGGTATCATTTAACAAA GGGGAGAGTTACTTTTTATTTC

**Oligo GBS67pAMBglrev (vedi operone)**

CACCTGTCATAGATCTTAAGAATACTAAAGCGCATAA

BgIII



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**Figure 234 D**

PCR Soe1: GBS67pAMXbafor + GBS67soe1rev 727 bp

PCR Soe2 non del: GBS322soe2for + GBS322soe2rev1 1260 bp

PCR Soe2 del: GBS322soe2for + GBS322soe2rev2 1260 bp

PCR Soe3 non del: fine67soe3for1 + GBS67pAMBglrev 2061 bp

PCR Soe3 del: fine67soe3for2 + GBS67pAMBglrev 1419 bp

PCR Soe4 non del. PCR25: GBS67pAMXbafor + GBS67pAMBglrev 4000 bp

Substrato PCRSoe1, 2, 3 non del

PCR Soe4 del, PCR26: GBS67pAMXbafor + GBS67pAMBglrev 3312 bp

Substrato PCRSoe1, 2, 3 del

**4- Substitution of GBS 52 with a fusion of GBS322-GBS52 to include GBS 322 into AI-1**

(same legend as for GBS67 derivatives)

a) Construct 1: GBS52 complete sequence included

b) Construct 2: Only part of GBS 52 was included (*deleted bold region*)**DETAILS:**

a) Construct 1:

&gt;GBS322-52 senza delezione di 52 (B) PCR 24

MKMNKKVLLTSTMAASLLSVASVQAQETDITWTARTVSEVKADLVKQDNK  
 SSYTVKYGDITLSVISEAMSIDMNVLAKEINNIADINLIYPETITLTVTYDQK  
 SLTATSMKIETPATNAAGOTTATVDIKTNQVSVADQKVSLNTISEGMTPE  
 AATTIVSPMKFYSSAPALKSKEVLAGEQAVSQAAANEQVSPA  
 PVKSIITSEVPAAKEEVKPTQTSVSQSTTVSPASVAAETPAPVAKVAPVRTVAAPRVAS  
 VKVVTPKVVETGASPEHVSAPAVPVTTTSPATDSKLOATEVKSVPVAKAF  
 IATPVAQPASTTNAAVAHPENAGLOPHVAAYKEKVAASYGVNEFSTYRAG  
 DPGDHKGKGLAVDFIVGTNOALGNKVAQYSTONMAANNISYVIWQOKFYSN  
 TNSIYGPANTWNAMPDRGGVTANHYDHVHVSFNK HQLTIVHLEARDIDRPNPQL  
 EIAPKEGTPIEGVLYQLYQLKSTEDGDLLAHWNSLTITELKKQAQQVFEA  
 TTNQQGKATFNQLPDGIYYGLAVKAGEKNRNVSAFLVDLSEDKVIYPKII  
 WSTGELDLLKVGVDGDTKKPLAGVVFELYEKNGRTPIRVKNGVHSQDIDA  
 AKHLETDSGHIRISGLIHGDYVLKEIETQSGYQIGQAETAVTIEKSKTV



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TVTIENKKVPTPKVPSRGGL  QQAMALVIIGGILIALALRLLSKH  
RKHQNKD

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**Figure 234 E****b) Construct 2:**

&gt;GBS322-52 (A) PCR 23

MKMNKKVLLTSTMAASLLSVASVQAQETDTTWTARTVSEVKADLYKODNK  
 SSYTVKYGDTLSVISEAMSIDMNVLAKINNIADINLIYPETTLTVTYDOK  
 BHTATSMKIETPATNAAGCOTTATYDLKTNQVSVADOKVSLNTISEGMTPE  
 AATTIVSEFMKTYSSAPALKSKEVLAQEQAVSQAAANEQVSPA  
 PVKGITSEVPAAKEEVKPTQTSVSGSTTVSPASVAAETPAPVAKVAPVRTVAAPRVAS  
 VKWVTPKVVETGASPEHVSAPAVPVTTTSPATDSKLQATEVKSPVAQKAF  
 IATPVAQPASTTNAAHPENAGLOPHVAAAYKEKVASTYGVNEFSTYRAG  
 DPQDHGKGLAVDFMGTNQALCNKVAQYSTQINMAANNISYVWQOKFYSN  
 TNSLYGPANTWNAMPDRGGVTANHYDHVHVSEFK  
 QGKATFNQLPDGIYYGLAVKAGEKNRNVSAFLVDLSEDKVIYPKII  
 WSTGELDLLKVGVDGDTKKPLAGVVFELYEKNGRTPIRVKNGVHSQDIDA  
 AKHLETSSGHIRISGLIHGDYVLKEIETQSGYQIGQAETAVTIEKSKTV  
 TVTIENKKVPTPKVPSRGGLEKTCQQAMALVIIGGILIALALRLLSKH  
 RKHQNKD

**Oligos to be used:**

Oligo 322Aflfor1

AGTCAGTCCTTAAGGATATTATAGTCTCGGACTA

Afl II

Oligo 52 soe1 forA

CAAGCTATCATTAAACAAAACAGGAAAGGCTACATTAAACG

Oligo 52 soe1 forB

TTCACCTATGATTAAACAAAACATCAGTTGACGATTGTTTCATC

Oligo52 soe1revA

AAATGTAGCCTTTCCTTGTTTGTTAAATGATACCTGAACG

Oligo52 soe1revB

AACAATCGTCAACTGATGTTTGTTAAATGATACCTGAACG

Oligo 52Xhorev

AAGACCTCCTCGAGATGGCACTT

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Xho I

PCR Soe1A: Oligo 322Aflfor1+ Oligo 52 soe1 revA 1370 bp

PCR Soe2A: Oligo52 soe1forA + Oligo 52Xhorev 520 bp

PCR Soe3A: Oligo 322Aflfor1 + Oligo 52Xhorev 1846 bp (con PCR Soe1A + PCR Soe2A)  
(PCR23)

PCR Soe1B: Oligo 322Aflfor1+ Oligo 52 soe1 revB 1370 bp

PCR Soe2B: Oligo52 soe2forB + Oligo 52Xhorev 742 bp

PCR Soe3B: Oligo 322Aflfor1 + Oligo 52Xhorev 2068 bp (con PCR Soe1B + PCR Soe2B)  
(PCR 24)



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Figure 235

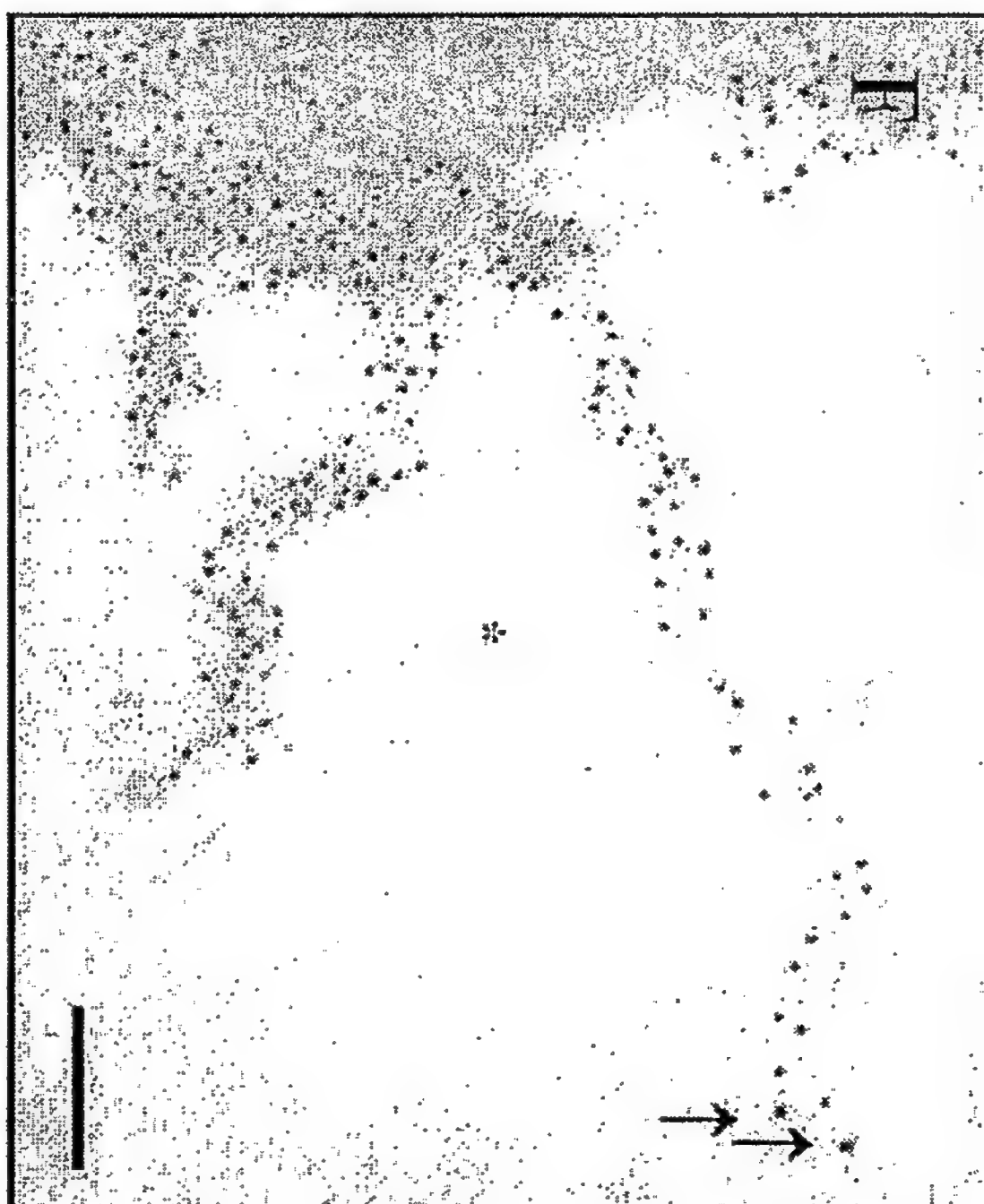


Figure 236



# Strain variability - GBS67: 2 alleles

1 MRKYQKPSKILTLFLCLISQIPLNTNVLGESTVPENGAKGLVVKTTDDQ 50  
|||||  
1 . . . . . NVLGESTVPENGAKGLVVKTTDDQ 25  
51 NKPLSKATFVLKTTAHPESKIEKVTAELTGEATFDNLIPGDYTLSEETAP 100  
|||||  
26 NKPLSKATFVLKPTSHSESKEVKVTTEVTGEATFDNLTPGDYTLSEETAP 75  
101 EGYKKTQTQWQVKVESNGKTTIQNSGDKNSTIGQNQEELDKQYPTGIYE 150  
|||||  
76 EGYKKTQTQWQVKVESNGKTTIQNSDDKKSIIIEQRQEELDKQYPLTGAYE 125  
151 DTKESYKLEHVKGVPNGKSEAKAVNPYSSEGEHIREIPEGTLSKRISSEV 200  
|||||  
126 DTKESYNLEHVKNIPNGKLEAKAVNPYSSEGEHIREIQEGTLSKRISSEV 175  
201 GDLAHNYKIELTVSGKTVKPVDKQKPLDWVFLDNSNMNDGPNFOR 250  
|| |||||  
176 NDLDHNYKIELTVSGKSIKTINKDEPLDWVFLDNSNMKNNGKN... 222  
251 HNKAKKAAEALGTAVKIDILGANSNDRVALVTYGSDFDGRSVDVVKGEKE 300  
|||||  
223 .NKAKKAGEAVETIIKDVLGANVENRAALVTYGSDFDGRTVKVIKGEKE 271  
301 DDKYGLQTKFTIQENYSHKQLTNNAEEIIKRIPTAPKAKWGSTTNGL 350  
| |||||  
272 .DPYYGLETSFTVQTFNDYSYKFTNIAADIIKKIPKEAPEAKWGGTSLGL 320  
351 TPEQQKEYYLSKVGETFTMKAFMEADDLISQVNRNSQKIIVHVTDDGVPT 400  
|||...||  
321 TPEKKREYDLSKVGETFTMKAFMEADTLSSIQRSRKIIIVHLTDGVPT 370  
401 SYAINNFKLGASYESQEQMKKNGYLNKSNFLLTDKEDIKNGESYFLF 450  
|||||. |..|  
371 SYAINSFVKGSTYANQFERIKEKGILDKNNYFIITDDPEKIKNGESYFLF 420

Differences  
between strains  
2603 and H36B  
(AA not matching/AA  
total and % of homology)

114 / 828 (87,1%)

451 PLDSYQTQIIISGNLQKLHYLDLNLNYPKGTIYRNGPVKEHGTPTKLYINS 500  
|||||  
421 PLDSYQTQIIISGNLQKLHYLDLNLNYPKGTIYRNGPVREHGTPTKLYINS 470  
501 LKQKNYDIENFGIDISGRQVYNEEYKKNQDGTFOKLKEEAFKLSGDGEIT 550  
|||||  
471 LKQKNYDIENFGIDISGRQVYNEDYKKNQDGTFOKLKEEAFKLSGDGEIT 520  
551 ELMRSFSSKPEYYTPIVTSADTSNNEILSKIQQFFETILTKEINSIVNGTI 600  
||| |||||  
521 ELMRSFSSKPEYYTPIVTSADSVNNEILSKIQQFFETILTKEINSIVNGTI 570  
601 EDPMGDKINLQLGNGQTLQPSDYTLQNGDSVMKDGATGGPNDGGILK 650  
|||||  
571 EDPMGDKINLHLGNGQTLQPSDYTLQNGDSIMKDSIATGGPNDGGILK 620  
651 GVKLEYIGNKLYVRGLNLGEGQKVTLTYDVKLDSDSFISNKFYDTNGRTTL 700  
|||||  
621 GVKLEYIKNKLYVRGLNLGEGQKVTLTYDVKLDSDSFISNKFYDTNGRTTL 670  
701 NPKSEDPNTLRDFPIPKIRDVREYPTITIKNEKKLGEIEFIVDKDNKL 750  
|||||  
671 NPKSEEPDTLRDFPIPKIRDVREYPTITIKNEKKLGEIEFIVDKDNKL 720  
751 LLKGATFELQEFNEDYKLYLPIKNNNSKVVTGENGKISYKDLKDGKYQLI 800  
|||||  
721 LLKGATFELQEFNEDYKLYLPIKNNNSKVVTGENGKISYKDLKDGKYQLI 770  
801 EAVSPEDYQKITNKPILTFFEVVKSGSIKNIIAVNKQISEYHEEGDKHLITN 850  
|||||  
771 EAVSPKDYQKITNKPILTFFEVVKSGSIQNI IAVNKQISEYHEEGDKHLITN 820  
851 THIPPKGIIPMTGGKILSFILIGGAMMSIAGGIYIWKRYKKSSDMSIKK 900  
|||||  
821 THIPPKGI..... 828

Figure 237

# Strain variability - GBS67 Allele I (2603)

Strain	Differences in comparison with 2603 (% of homology)
2603	-
18RS21	1/833 (99.9%)
CJB111	14/833 (98.3%)
515	2/833(99.8%)

Figure 238



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# Strain variability - GBS67 Allele II (H36b)

Strain	Differences in comparison with H36b (% of homology)	FACS ( $\alpha$ -67 from 2603)
H36B	-	444
1169	10/823 (98.8%)	443
090	9/316 Stop codon (8G to 7G)	0
CJB110	11/824 (98.7%)	245

Figure 239

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(54) Title: IMMUNOGENIC COMPOSITIONS FOR GRAM POSITIVE BACTERIA SUCH AS STREPTOCOCCUS AGALACTIAE

(57) Abstract: The invention relates to the identification of a new adhesin islands within the genomes of several Group A and Group B Streptococcus serotypes and isolates. The adhesin islands are thought to encode surface proteins which are important in the bacteria's virulence. Thus, the adhesin island proteins of the invention may be used in immunogenic compositions for prophylactic or therapeutic immunization against GAS or GBS infection. For example, the invention may include an immunogenic composition comprising one or more of the discovered adhesin island proteins.



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# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/27239

## A. CLASSIFICATION OF SUBJECT MATTER

IPC: A61K 39/02( 2006.01)

USPC: 424/190.1

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 424/190.1

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)  
MEDLINE, BIOSIS, HCAPLUS, EMBASE, DERWENT, PUBLISHED APPLICATIONS AND ISSUED PATENTS.

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	WO 02/34771 A2 (TELFORD et al ) 02 May 2002 (02.05.2002), see pages 1411 and 3057. (only the relevant pages provided)	1-7 and 17-24
X	LARSSON et al. Protection against experimental infection with group B streptococcus by immunization with a bivalent protein vaccine. Vaccine. February 1999, Vol. 17, No. 5, pages 454-458.	1-7 and 17-24

☐ Further documents are listed in the continuation of Box C.

☐ See patent family annex.

### \* Special categories of cited documents:

"A" document defining the general state of the art which is not considered to be of particular relevance

"E" earlier application or patent published on or after the international filing date

"L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)

"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone

"Y"

document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art

"&"

document member of the same patent family

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## INTERNATIONAL SEARCH REPORT

International application No.

PCT/US05/27239

### Box No. II Observations where certain claims were found unsearchable (Continuation of item 2 of first sheet)

This international search report has not been established in respect of certain claims under Article 17(2)(a) for the following reasons:

1. ☐ Claims Nos.:  
because they relate to subject matter not required to be searched by this Authority, namely:
2. ☐ Claims Nos.:  
because they relate to parts of the international application that do not comply with the prescribed requirements to such an extent that no meaningful international search can be carried out, specifically:
3. ☐ Claims Nos.:  
because they are dependent claims and are not drafted in accordance with the second and third sentences of Rule 6.4(a).

### Box No. III Observations where unity of invention is lacking (Continuation of item 3 of first sheet)

This International Searching Authority found multiple inventions in this international application, as follows:  
Please See Continuation Sheet

1. ☐ As all required additional search fees were timely paid by the applicant, this international search report covers all searchable claims.
2. ☐ As all searchable claims could be searched without effort justifying additional fees, this Authority did not invite payment of any additional fees.
3. ☒ As only some of the required additional search fees were timely paid by the applicant, this international search report covers only those claims for which fees were paid, specifically claims Nos.: 1-7 and 17-24
4. ☐ No required additional search fees were timely paid by the applicant. Consequently, this international search report is restricted to the invention first mentioned in the claims; it is covered by claims Nos.:

- Remark on Protest**
- ☐ The additional search fees were accompanied by the applicant's protest and, where applicable, the payment of a protest fee.
- ☐ The additional search fees were accompanied by the applicant's protest but the applicable protest fee was not paid within the time limit specified in the invitation.
- ☐ No protest accompanied the payment of additional search fees.

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US05/27239

### BOX III. OBSERVATIONS WHERE UNITY OF INVENTION IS LACKING

1. This application contains the following inventions or groups of inventions which are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for all inventions to be examined, the appropriate additional examination fees must be paid.

Group I, claim 1 -7 (in part) drawn to an immunogenic composition comprising a purified Group B Streptococcus adhesion island polypeptide.

Further species election to one composition comprising GBS AI -1 or GBS AI -2 required (see paragraph # 3).

Group II, claims 8-16 (in part) drawn to an immunogenic composition comprising a purified gram positive adhesion island polypeptide.

Further species election to one composition comprising one bacteria and one GAS AI -1 ,GAS AI -2,GAS AI -3 and GAS AI -4 required (see paragraph # 3).

Group III, claims 17-24 (in part) drawn to an immunogenic composition comprising a first and second purified Group B Streptococcus adhesion island polypeptide.

Further species election to one combination of first and second polypeptide (see paragraph # 3).

Group IV, claims 25-34 (in part) drawn to an immunogenic composition comprising a first and second gram positive GAS AI -adhesion island polypeptide.

Further species election to one combination of first and second polypeptide (see paragraph # 3).

Group V, claims 35-39 and 40 (in part) drawn to a modified gram positive bacterium and a method of manufacturing adhesion island antigen

Further species election to one modified gram positive bacterium required (see paragraph # 3).

Group I is directed to an immunogenic composition comprising polypeptide GBS AI -1 or GBS AI -2 whereas Group II is drawn to immunogenic composition comprising gram positive bacterial adhesion polypeptides GAS AI -1 , GAS AI -2 , GAS AI -3 and GAS AI -4 . These inventions are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1 because these two compositions do not share a common structure ,property and function as group I contains GBS polypeptide where as group II comprises GAS polypeptides . Group III and Group IV are also drawn to compositions as group III comprises combination of two polypeptides from GBS that shares no common structure ,property and function with Group IV as it comprises GAS polypeptide and thus do not share a single inventive concept. Thus these inventions are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1 Group V is drawn to a modified bacterium from GBS , GAS and non-pathogenic gram positive bacterium comprising expressing polypeptide GBS- AI -1or GBS-AI-2 and not share a single inventive concept from other four groups as the composition contains polypeptides which does not share a common structure, property and function.

## INTERNATIONAL SEARCH REPORT

International application No.  
PCT/US05/27239

2. This application contains claims directed to more than one species of the generic invention. These species are deemed to lack unity of invention because they are not so linked as to form a single general inventive concept under PCT Rule 13.1. In order for more than one species to be examined, the appropriate additional examination fees must be paid. The species are as follows:

3 Group I species: GBS AI -1 80, 104, 52, 59, 67, 150, 01521, 01523, 01524 or GBS AI -2

Group II species: GAS AI -1, GAS AI -2, GAS AI -3 and GAS AI -4.

Group III species: Any combination of first and second polypeptide from GBS AI -1 80, 104, 52, 59, 67, 150, 01521, 01523, 01524, GBS AI -2.

Group IV species: Any combination of first and second polypeptide from GAS AI -1, GAS AI -2, GAS AI -3 and GAS AI -4

Group V species: Modified gram-positive bacterium or non pathogenic bacterium expressing GBS AI -1 80, 104, 52, 59, 67, 150, 01521, 01523, 01524, GBS AI -2, GAS AI -1, GAS AI -2, GAS AI -3 and GAS AI -4

The inventions listed as Groups 1-5 do not relate to a single general inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons:

The technical feature of linking groups appears to be that they are all related to immunogenic compositions comprising adhesion peptides methods of making adhesion peptide.

However, Beckmann et al Infection and Immunity, June 2002, p. 2869-2876, Vol. 70, No. 6 disclose an immunogenic composition comprising adhesion oligomeric polypeptide ( see page 2871, left column last paragraph through right column and figure 3) As this polypeptide binds to fibrinogen it is an adhesion immunogen. Therefore, the technical feature of linking groups 1-5 does not constitute a special technical feature as defined by PCT Rule 13.2, as it does not define a contribution over the prior art and hence unity of invention is lacking.

The special technical feature of Groups 1-5 is considered to be immunogenic compositions comprising polypeptides that share no common structure, property and function and thus do not share the same or a corresponding technical feature.

Accordingly, Groups 1-5 are not so linked by the same or a corresponding special technical feature as to form a single general inventive concept.

The claimed species GBS AI -1 80, 104, 52, 59, 67, 150, 01521, 01523, 01524, GBS AI -2; GAS AI -1, GAS AI -2, GAS AI -3 and GAS AI -4 have no common structure and thus are not linked by the same or a corresponding special technical feature so as to form a single general inventive concept under Rule 13.1. Hence, unity is lacking among species.